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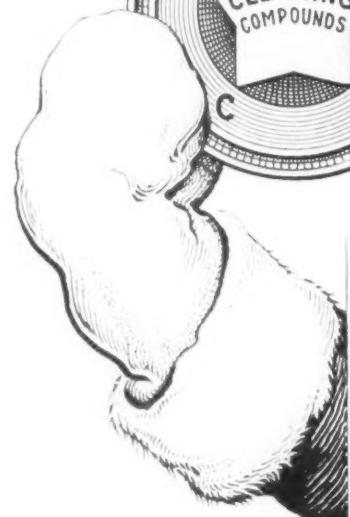
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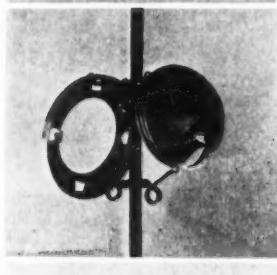
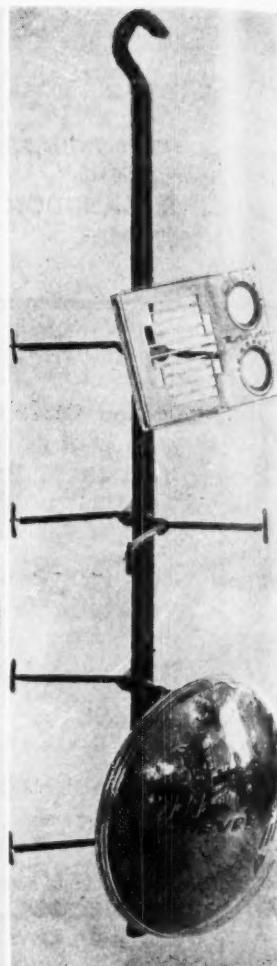
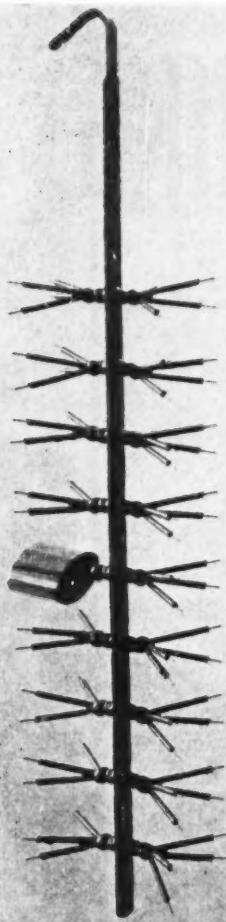
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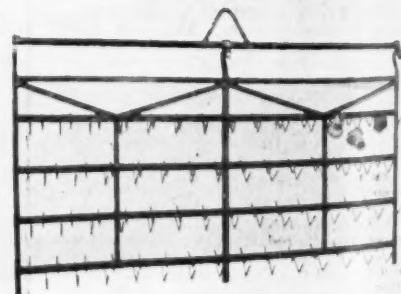
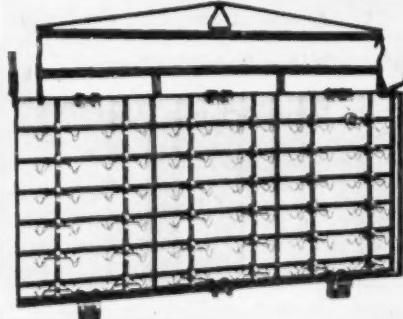
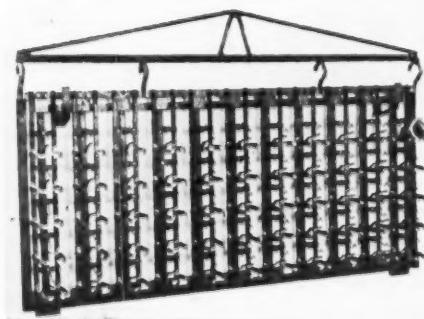
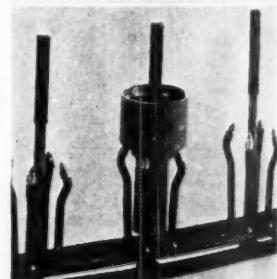
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Do We Understand Each Other?

The ambiguity of dimensional units, as employed in metal finishing practice, has long been a matter of concern and we have commented in the past on the advantages of the metric system. Although a success in the laboratory, there seems to be very little likelihood of its adoption in the shop because of the change required in all our measuring equipment and the loss of efficiency during the necessary period of mental adjustment.

If we are to continue to be saddled with the English system we can at least try to eliminate the ambiguity by clearly specifying the units in such a way that there will be no question about what we mean. Whenever we come across a formula specifying a liquid acid in oz./gal. we immediately wonder whether avoirdupois or fluid ounces are meant, although the former is generally assumed. Surely the same question arises in the minds of many of our readers! How often are we left in doubt when a formula is given in weight percentages. Does it call for 75% or 85% phosphoric acid? Does it call for 18°, 20° or 22° Baumé hydrochloric acid? Or, is it calculated on the basis of 100% H₃PO₄ or HCl, as the case may be?

The desirability of clarity in this connection was recalled to mind as a consequence of thumbing through the most recent edition of "Electro-Plating" by Field and Weill. The authors are British and the book was published in Great Britain but, we venture the prediction that most of the American platers who have purchased copies will use the formulas as given, without taking into consideration the fact that the British or Imperial gallon is twenty percent larger than our gallon. This, of course, is no fault of the authors and the British readers of the "Plating and Finishing Guidebook" undoubtedly make the same error. As a matter of fact, since most of the formulas are given in both oz./gal. and g./L., an observant reader will quickly note that Imperial gallons are being employed, although the authors would have set an excellent precedent had they used the term throughout the book instead of in one or two instances only. Only in rare instances have we ever noticed American references to British formulas referring to or correcting for the difference in units, and vice versa.

If the practice were adopted of always including clarifying symbols, such as Imp. or U. S. when referring to liquid measure units and av. or fl. when dealing with ounces, it would insure a better exchange of ideas and more effective application of metal finishing developments.

THE SODIUM HYDRIDE DESCALING PROCESS

By DR. HARVEY N. GILBERT*

IN THE fabrication of metals at elevated temperatures a scale consisting of the oxides of the metals is formed. This scale varies in thickness depending on operating conditions and must be removed before the article can be subjected to such operations as cold rolling or drawing and various finishing treatments.

The common method of removing scale from ordinary steel is by pickling in acid. By this method, scale removal is accomplished partly by solution of the scale and partly by solution of the underlying metal.

Alloy steels, particularly the stainless steels, are more difficult to pickle than ordinary carbon steels. When acid pickling is used, pitting of the metal can occur if due care is not exercised and a loss of 2 to 3% of the basis metal may result.

The sodium hydride descaling process is a new method which eliminates most of the objectionable features of acid pickling. It is based on the use of a powerful reducing agent, sodium hydride dissolved in fused caustic, which reduces the metallic oxides in the scale. The reduced scale remains in loosely adherent form on the surface of the work. Sodium hydride is formed in the fused caustic bath by combining sodium metal with hydrogen in generators installed in the caustic tank. In operation the scale

is reduced by immersing the work in the fused bath. Upon quenching the work in water the reduced material is blasted from the surface by the generation of steam and it remains only to brighten the surface by a few seconds dip in acid.

Extension of the process has been restricted due to the diversion of sodium for other war purposes, chief of which was the manufacture of tetraethyl lead. In spite of these restrictions a number of large installations were placed in operation and, now that sodium is again available, it is expected that the process will be employed in a wide field of application.

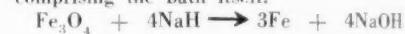
This article describes laboratory development of the process and the first large-scale commercial installation at the Rustless Iron and Steel Corporation, Baltimore, Md.

Laboratory Development

Metallic sodium is a good reducing agent and attempts were first made to employ it to reduce the oxide scale. Difficulty was experienced in wetting the scale uniformly with the sodium. Where reaction did occur, the reduction was accompanied by the formation of sodium oxide, which was corrosive. Other difficulties were experienced in removing excess sodium from the treated work and a special technique would have been required to operate a molten sodium bath at elevated temperatures in the presence of air.

Solution of sodium in molten caustic was tried but was soon discarded because of the accumulation of sodium oxide in the molten caustic. Such a bath dissolves iron oxide and other constituents of the scale but this contaminates the bath and eventually deposits the dissolved scale as sludge in the bath in excessive amounts. In addition, a solution of sodium oxide in caustic is very corrosive to the iron of the tank walls.

Sodium hydride was found to dissolve in molten caustic and such solutions were found to reduce iron oxide to metallic iron. The sodium hydride reacts with the scale to form caustic soda which is the material comprising the bath itself.



Thus no undesirable impurities are added to the bath and the metal walls of the tank are not attacked. It was later found that the presence of sodium hydride decreases the corrosion of iron in fused caustic.

Sodium hydride in caustic was found to reduce nickel and cobalt oxides to the corresponding metals. Chromic oxide is reduced to a lower oxide but not to the metallic state.

Operation of Process

WATER QUENCH

With the stainless alloys, most of the reduced metals and lower oxide of chromium remain on the work as it is removed from the bath and are largely removed by the water quench. The work, which is at 700°F., generates steam which blasts the loose material from the surface. In some cases the reduced metal comes off in the water in large patches; in other cases it is more finely divided. The surface of the work after the water quench has a matte appearance because some of the reduced material is not removed. This material is soft and does not harm tools and dies, as the original scale does, but it is usually desirable to eliminate entirely the reduced material. This is readily done by a short acid dip.

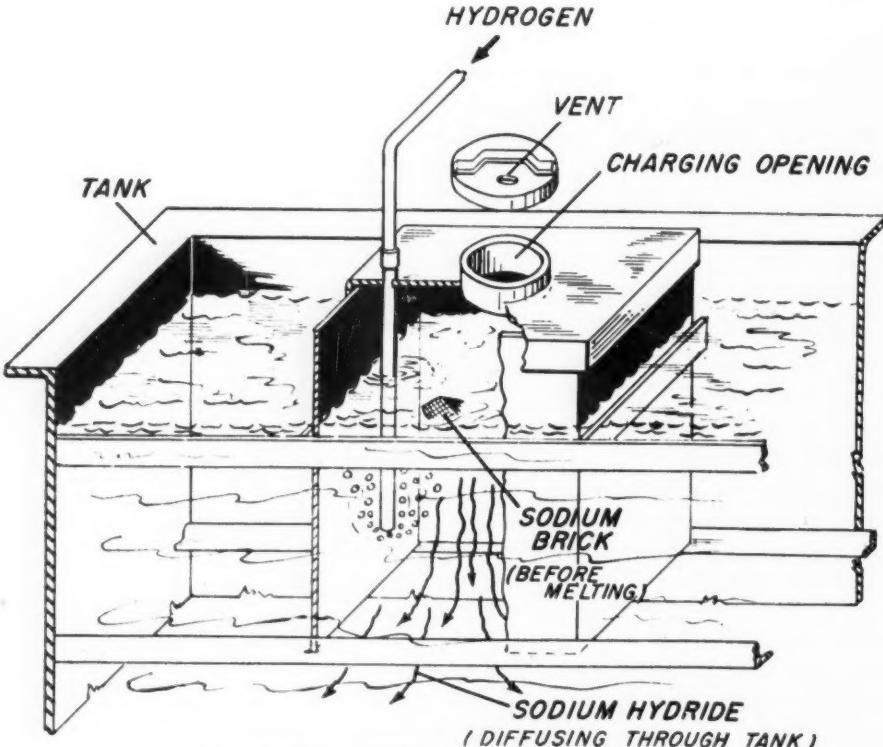
ACID DIP

The treatment will vary with the alloy. In practice, a 2 to 5 minute dip in hot 5% to 10% sulfuric acid is used to remove the reduced metal adhering to the work. For alloy steel a thirty-second to one-minute dip in 10% nitric acid at 160°F. is sufficient to produce a bright surface.

Some of the stainless steels require a somewhat longer treatment in the nitric acid and 2% hydrofluoric acid is sometimes of advantage in the 10% HNO₃. In any case the acid dip is used as a brightener and passivator rather than as a pickling operation.

After the brightening dip a good wash with a high-pressure water hose will produce a

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clean metal surface and the work is then dried in the usual way.

TEMPERATURE

The bath temperature is not critical so far as the reduction of scale is concerned. A working temperature of $700^{\circ}\text{F.} \pm 20^{\circ}$ was found to be the most practical. Higher temperatures cause excessive loss of hydride. Lower temperatures cause difficulty by forming a frozen layer of bath on the cold work when first introduced and additional time is required to melt this frozen layer before the liquid bath can act on the scale.

CONCENTRATION OF HYDRIDE

Concentrations of NaH as low as 0.5% are effective but, as this small amount is quickly reacted locally when it contacts the scale, it is more practical to carry from 1.5 to 2.0% sodium hydride in the bath at all times. No additional advantage results from the use of higher hydride concentrations and the open surface of the bath loses hydride more readily by reaction with air at the higher concentrations.

TIME

The time required to reduce scale varies from a few seconds to 20 minutes depending on the thickness and nature of the scale and the conditions under which it was originally formed.

Source of Sodium Hydride

While the early laboratory investigations were carried out by adding solid sodium hydride to the bath, the material was not at that time commercially available. Experiments were made to determine the possibility of forming the hydride directly in the bath from sodium and hydrogen.

Sodium was placed in a vessel which contained fused caustic and had a nitrogen atmosphere. The sodium melted and floated on the surface of the caustic. Hydrogen gas was bubbled into the caustic layer. It was found that the hydrogen reacted with the sodium and when the sodium had disappeared the caustic contained sodium hydride equivalent to the sodium added. This hydride bath acted on scale identically with the bath made by dissolving solid sodium hydride in fused caustic.

An apparatus was then developed for carrying on this reaction continuously and was used in subsequent laboratory work. An iron pot for melting caustic was fitted with a cover which had three openings. Through one opening a cylinder was suspended which was open at the bottom and dipped about six inches beneath the caustic surface. The cylinder was equipped with a removable cover and thus formed a bell in which a layer of sodium was maintained by removing the cover and adding solid metal from time to time. A hydrogen inlet pipe was introduced through the second hole in the large pot cover and arranged to discharge hydrogen into the caustic beneath the sodium in the bell. The third hole was used to introduce work to be treated into the fused caustic bath. In this manner, by regulating the sodium and hydrogen additions, hydride concentrations of any desired amount up to 18% could be maintained in the bath.

It was necessary to keep the caustic bath

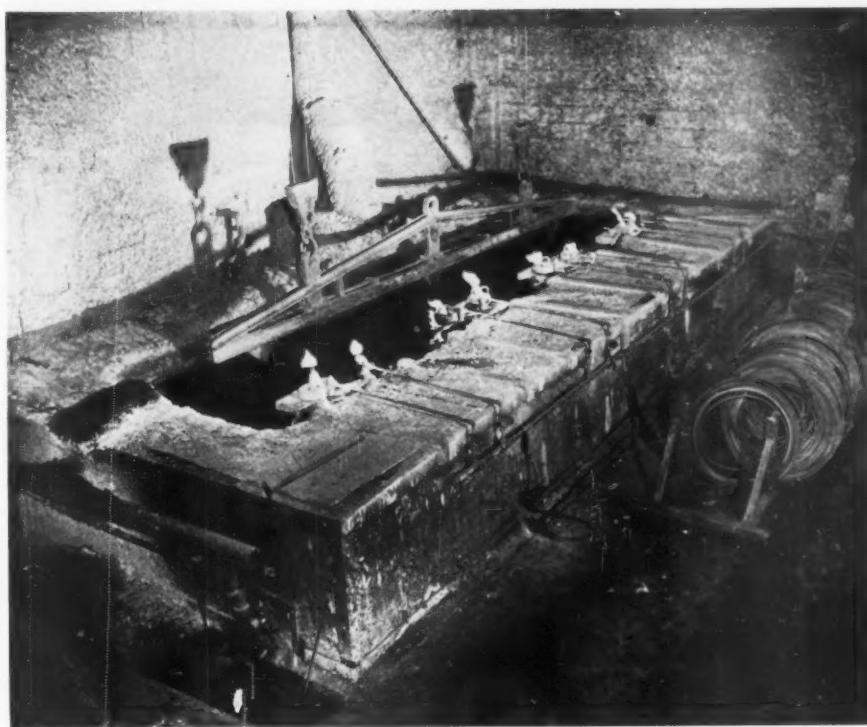


Fig. 2. The bath shown above, has been operating, with only mechanical improvements, for four years in the plant of the Rustless Iron and Steel Corporation, Baltimore, Md.

covered when concentrations higher than 5% hydride were employed, as excessive fuming and loss of hydride occurred in open air. Concentrations up to 2% could be exposed to air without noticeable fuming although air did tend to reduce the hydride test in time.

Considerable loss of NaH occurs in an open bath because of the attraction of NaH for oxygen but for a working bath this loss is economically practical and can be avoided by methods of sealing off the bath surface when not in use.

In this bath samples of carbon steels, alloy steels and stainless steels as well as such other metals as nickel, cobalt and copper were descaled readily. The bath cannot be used to remove the oxide from aluminum and its alloys and it is not feasible to treat zinc, magnesium, cadmium or their alloys because of the reaction of the metals with the bath.

No hydrogen embrittlement was ever found with steels. Tests made on samples treated for long periods showed no deterioration of the physical properties of the steels. The working temperature of the bath is 700°F. , which is well below steel's transition temperature.

Here then was the making of a powerful new bath which would react with scale wherever it contacted it. In a sense it is an alkaline pickling bath which required no electric current. Furthermore, the reduced scale remained on the work and was removed with the work without contaminating the bath. Laboratory tests on a variety of stainless and alloy steels indicated that it had wide possibilities and was not limited to a few classes of steel.

Based on the laboratory data just described, apparatus was designed for generating hydride in a large caustic tank $4' \times 10' \times 15'$

$\times 5'$ with furnace setting which had been used for previous experiments at the Rustless Iron and Steel Corporation plant.

Six hydride generators were constructed and mounted in the caustic tank along one side. These generators are rectangular boxes open at the bottom and having a cover with two 5" diameter feed holes also provided with removable caps. The bottom of the generators is 16" below the average bath depth. A gas inlet tube passes through the cover of each box and delivers the gas into the generator near the bottom. Hydrogen was obtained by dissociating ammonia in a standard dissociator. After dehydrating the bath a concentration of 1.5% NaH was built in the bath.

A steel water-tank located about 6 feet from the caustic tank was used for quenching the work. Exhausters in the wall above the water tank served as ventilators.

The descaling unit was installed in a corner of the pickle room and no additional equipment was required other than that used in the usual pickle house.

Hot-rolled rod was suspended on a horizontal rack and submerged in the fused caustic bath for 15 minutes. On removing the work from the caustic bath and quenching it in the water tank the result duplicated laboratory results and most of the scale was removed in the quench tank. The remaining reduced material which gave a gray matte appearance to the surface was then quickly removed by a 1 to 2 minute dip in 10% HNO_3 , after which the work was washed and dried in the usual manner.

The process went into production immediately and has had only mechanical improvements during the past four years.

Later a tank $4' \times 10' \times 28' \times 5'$ was installed to take care of bars as well as other

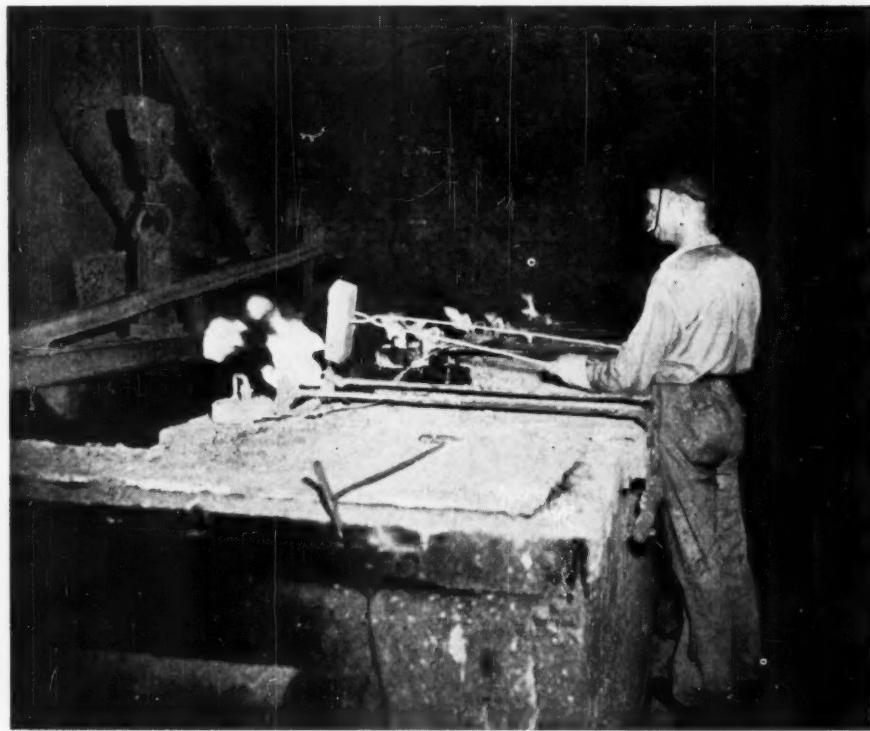


Fig. 3. At intervals the operator replenishes the sodium supply for the hydride bath, dropping sodium bricks into the generator boxes just as is shown above.

work. The installation has a capacity for treating 60 tons of work per day and is used for wire, rod, and bar stock of the various grades of stainless steel.

A Typical Installation

Based on the Rustless installation, the following describes the equipment and operation of a large-scale installation for descaling stainless steel:

RAW MATERIALS

Sodium—Used in the form of 2½ lb. or 5 lb. bricks which are shipped in returnable steel barrels containing 280 lbs. sodium, net. From 6 to 12 lbs. of sodium are used per ton of descaled metal.

Hydrogen—The most economical source is that obtained from dissociated ammonia. From 80 to 160 cubic feet of "cracked gas," corresponding to 2.15 to 4.3 lbs. of ammonia, are required per ton of descaled metal.

Caustic Soda—An initial bath of fused caustic soda is required. This is made from 76 to 78% caustic (calculated as Na₂O). After the original installation, very little more is required, as caustic soda is produced as a by-product of the descaling reaction and the amount formed usually compensates for the amount lost by the dragout.

The amount of caustic soda required depends on the size of the tank which in turn must be of sufficient size to accommodate the work.

EQUIPMENT

Descaling Tank—A low-carbon steel tank is used to contain the bath. The tank is mounted in a brick setting with the top approximately three feet above the floor level and facilities must be provided for heating the bath to 700°F.

ranged end to end with at least a four-foot space between them and an overhead crane with remote control should be used to move the work.

Generator Boxes for Sodium—Simple welded, ordinary steel generator boxes are mounted on brackets along one side of the caustic tank.

Source of Hydrogen—Any dry gas mixture containing hydrogen which is free from oxygen, CO and CO₂ can be used. Nitrogen and low percentages of hydrocarbons are not objectionable.

For small installations the use of cylinder hydrogen is practicable. The most practical material for large-scale installations is "cracked gas" obtained by the dissociation of ammonia. Dissociators for this purpose can be obtained as standard equipment from a number of manufacturers.

In many plants such equipment is already installed for use in bright annealing. In these cases it may be possible to divert a portion of the cracked gas for use in the sodium hydride descaling process. A meter capable of measuring a total of 500 cu. ft. of gas per hour is required.

Other Equipment—The only other equipment consists of standard items such as crane, rack for work and other means for moving the work about in the plant.

Operating Procedure

Fused caustic contains moisture and must be dehydrated before hydride can be formed. This is done in starting a new bath by placing sodium bricks on the open surface where the sodium melts and floats and skims around in patches, due to the evolution of hydrogen from the water. The hydrogen burns without violence and only toward the end of the dehydration period does the

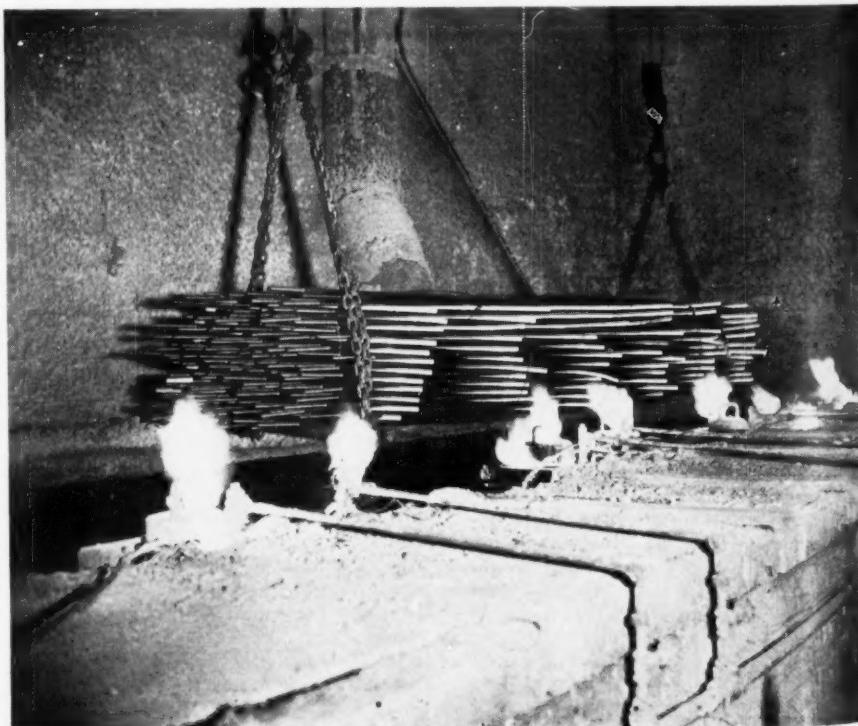


Fig. 4. Stainless steel bars are shown ready for dipping in the sodium hydride bath.

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sodium show a tendency to burn. Any burning can be readily stopped by stirring the sodium patch with an iron rod.

When the bath is completely dehydrated, striking color change occurs. The bath suddenly becomes black and no more hydrogen is evolved. The bath becomes perfectly quiet and has the appearance of a black oil. During the dehydration period ventilation of the room is desirable as a caustic spray is formed due to the hydrogen generation. After the dehydration period the bath produces practically no gas or fumes and is operated as an open bath without ventilation. Dehydration is only required in starting new bath and does not have to be done again even if the bath remains idle for long periods.

Hydrogen (or cracked ammonia gas) is then added to each of the generator boxes. A maximum flow of 150 cubic feet per hour of "cracked gas" is required for each generator box. In normal operation a slight excess of hydrogen is allowed to burn from a small vent hole in the charging cover of each generator. If cracked ammonia is used, 3.8 pounds of anhydrous ammonia will usually be required per ton of steel treated.

Sodium is added at intervals by introducing sodium bricks through the charge hole of the generator box. The sodium is introduced by means of tongs and during its introduction hydrogen is allowed to burn from the charge hole. Normally, one $2\frac{1}{2}$ lb. brick is added to each generator every 15 minutes. From 6 to 12 pounds of sodium are required per ton of steel treated, depending on the relative amount of surface to be descaled.

The sodium hydride content is maintained between 1.5 and 2.0% and this is determined by a simple gas test with a gas evolution apparatus. If test becomes low, the rate of

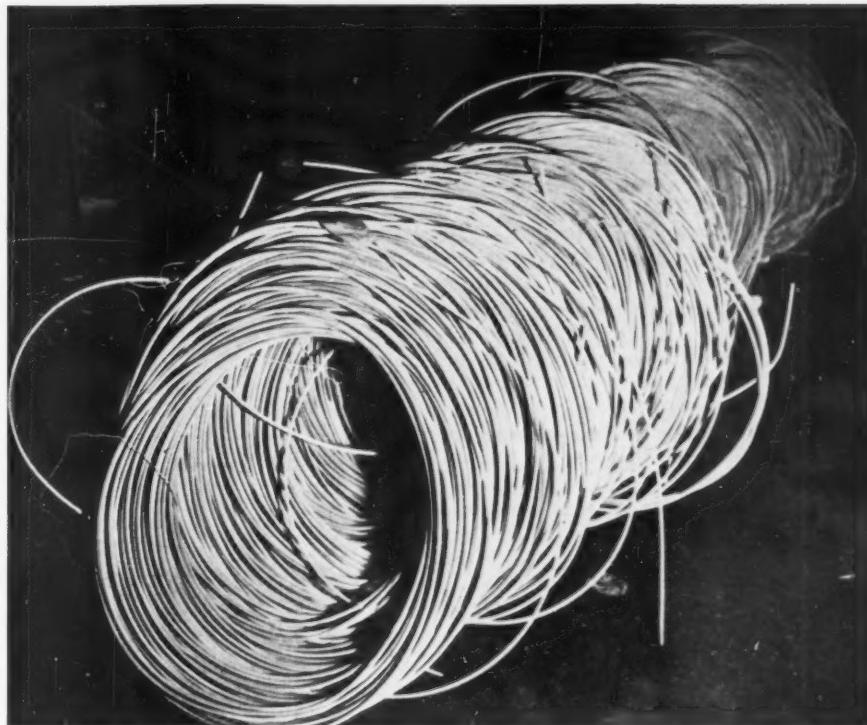


Fig. 5. Pictured above is stainless steel wire after it has been descaled in sodium hydride and brightened by a quick dip in acid.

sodium feed is increased. If the test exceeds 2%, the rate of feed is decreased.

The temperature is maintained between 680°F . and 720° . Work to be descaled is placed on a steel rack and lowered into the fused caustic bath. Time of immersion will depend on a number of factors such as the mass of the work, character of the scale, etc., but for a load of 3,000 pounds of stainless

sheet or wire the time of immersion will be from 10 to 15 minutes.

The rack and its load is then removed from the caustic bath and lowered slowly into the quench tank. The work can then be removed at once. This quenching operation produces steam, and ventilation should be provided at the side of this tank to remove the steam and caustic spray from the room. After the water quench, the work may be dipped for one to two minutes in a suitable acid bath. This treatment will brighten the work if a bright finish is desired.

Fundamentally the process is as safe as any other process involving fused baths. Metallic sodium is handled in brick form to charge the generators, with the one requirement that water does not come in contact with the sodium. The usual safety precautions in using fused baths must be observed and most plants are familiar with the handling of hydrogen or "cracked ammonia" gas.

Advantages of Process

1. The bath, containing active sodium hydride, penetrates throughout the work and produces uniform descaling of all surfaces.

2. All grades of alloy steels can be descaled by this bath and different grades can be descaled interchangeably using the same procedure.

3. There is no loss of metal, thus eliminating losses of 2 to 3% usually lost in other pickling processes.

4. No harm can result from too long treatment in this bath. The hydride bath will not cause pitting of the work.

5. Since the bath does not attack metal

(Concluded on page 533)

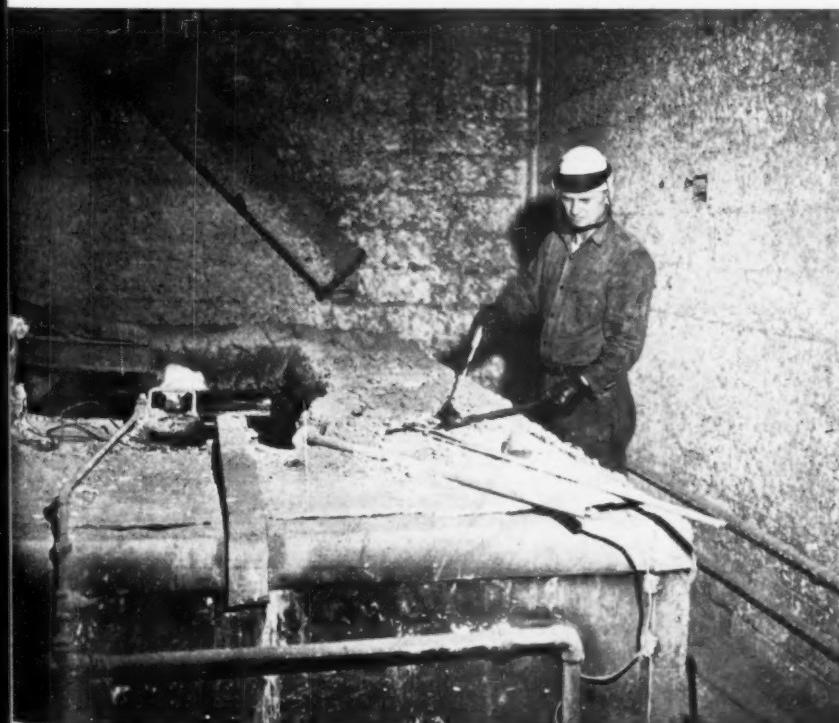


Fig. 6. In the picture above the operator is shown sampling the bath preparatory to testing the sodium hydride content.

CLEANING BEFORE PACKAGING

By GEORGE BLACK

THE subject of cleaning always reminds us of the protesting youngster who told his mother that if she continued to scrub his neck with that stiff brush she'd wear the skin off. It is impossible to over-emphasize the necessity for thorough cleaning, but it should never be forgotten that more harm than good can result from the choice of the wrong method.

There is no all-purpose cleaner either on the market, or in the wanderings of scientific minds. There is, however, a satisfactory cleaning method for every imaginable contaminant. The choice of the cleaning method to be used must depend upon such things as the composition of the part, the nature of the surface, the complexity of construction, the nature of the contaminants to be removed, the degree of cleanliness required and the availability of cleaning materials and equipment.

In consideration of the composition of the parts it must be determined whether the cleaning material will attack the piece chemically, or leave irremovable residues which might cause corrosion at a later date. Aluminum, for example, should not be cleaned in baths containing caustic soda, caustic potash or high alkaline ratio silicates; and it certainly wouldn't do to try carbon steels in nitric acid. In general it can be said that no cleaning method should be put into effect until there is a full understanding of the reaction between the cleaning solution and the material being cleaned.

In relation to the nature of the surface to be cleaned, it should be remembered that the degree of finish, polish and dimensional accuracy must be considered. The use of alkaline cleaners for highly polished ball bearing surfaces might result in staining or light rusting which would render the part useless. Even solvent degreasing must be applied with extreme care, since decomposition of the chlorinated solvents may cause corrosion. Again it is a question of reaction between the solutions used and the material being cleaned, and it has been found that the application of organic solvents for the cleaning of fine surfaces is preferable in the long run.

Whenever possible, it is recommended that only unit parts or very simple assemblies receive any type of immersion or spray cleaning. The dangers of potential corrosion due to improper rinsing or the entrapping of cleaning solutions or moisture in laps or crevices should not be minimized. A safe generalization for the cleaning of complicated structures is to clean with petroleum solvents, since it is less likely that cleaning residues will occur . . . and even if they do there is far less possibility of eventual damage from these residues than from those left by cleaners containing water and alkalies.

To go back a bit. Since cleaning is essentially the removal of dirt, and dirt is any substance foreign to the construction or composition of the material on which it occurs, we ought to look into the nature of these contaminants before we establish any cleaning method. If the contaminant is any material which is readily soluble in organic solvents or easily emulsifiable, then either solvent cleaning or alkaline cleaning may be selected. If the contamination is inorganic, such as residual fluxes or heat treat salts, and is not soluble in organic solvents, then alkaline cleaning may be necessary. If neither solvent cleaning nor alkaline will do the job it may be necessary to resort to mechanical methods such as buffing, sanding, or scratch brushing. Regardless of the contaminant being removed, however, consideration must be given to the factors outlined above, namely, the type of material, the nature of the surface, and the construction of the unit.

In selecting a cleaner it is extremely important to know to what extent removal of contaminants is necessary. It is obvious that finger-print stains which may ruin a highly finished part, will have only a negligible effect on a rough casting. From the viewpoint of economy, then, it is wise to find out just what has to be done. In line with this is the desirability of knowing your market, especially in relation to the availability of cleaning equipment and materials. When you know what has to be done, and what can be obtained to do the job, you're on the right track for efficient cleaning.

With this in mind, let's glance over the recommended cleaning methods to be found in the joint Army-Navy Aeronautical specification for the preservation and packaging of parts and equipment, AN-

P-13a. Appendix I of this informative specification gives quite detailed discussion of cleaning methods and well repays the reading.

The three recommended methods of cleaning are solvent, alkaline and emulsion. Solvent cleaners can usually be listed under three headings, namely, petroleum, chlorinated, and specialized solvents. The petroleum solvents are distillates or "cuts" of sufficiently high flash point, which are used at room temperature, for the removal of oil, grease, and non-pigmented drawing compounds. They are completely ineffectual for the removal of inorganic residues such as those from heat treating salts or perspiration. However, when applied by the spray method, or locally with a stiff brush, they are successful in the removal of free chips and inert particles of dirt.

Chlorinated solvents of the inhibited trichlorethylene or perchloroethylene type are used mainly in vapor degreasing. These solvents do a thorough job on oil or grease type dirt, and, if provided with a spray hose attachment, are effective for the removal of light, loose inorganic contaminants, but they are no better than petroleum solvents when it comes to the removal of inorganic residues.

The removal of inorganic residues is accomplished through the use of solvents such as synthetic wood alcohol (methanol) with a small percentage of water, or by a combination of a petroleum solvent, highly surface active compound and a small amount of water compounded into a homogeneous product. The methanol used must be at least 95% anhydrous. These compounds should always be used after all other cleaning has been completed, and it is essential that parts cleaned in methanol or other specialized solvent be thoroughly dried immediately after emersion.

Alkaline cleaning originally consisted of immersion in hot caustic soda or caustic potash solutions. Not only was this method ineffectual on mineral oil and other residues, but it was dangerous to use if complete and thorough rinsing and flushing could not be guaranteed. Today alkaline cleaning is the most widely applied cleaning method, and the term has been broadened to include alkali silicates, phosphates, borates and carbonates, all of which are used in combination with soap or newly developed synthetic wetting agents.

These cleaners are used at elevated temperatures, generally close to boiling, and perform their work through a combination of solution, chemical reaction and emulsification. Modern alkaline cleaners are effective for the removal of oil or grease films, as well for the removal of inorganic residues such as heat treating salts and perspiration. When speed is essential, alkaline cleaners are assisted by electricity. The cleaning solution used for electro-cleaning is basically the same as that used for alkaline immersion cleaning. However, the faster cleaning action is obtained by the liberation of gas bubbles at the surface of work being cleaned. Both the immersion (soak) method, and the electrical method do a thorough cleaning job in a single stage, but adequate rinsing must be employed to insure the removal of cleaner residues.

The use of emulsion cleaning is very limited due to the mildness of the cleaning action. Emulsion cleaning may be used for the removal of oil, grease or inorganic water soluble contaminants, but the degree of cleanliness does not quite meet the standards set by pure solvent or alkaline methods. When applied by spray, the emulsion cleaner is usually a combination of an organic solvent and water kept in a completely emulsified state by surface active agents. For the removal of heavy oil or grease contaminations an emulsion cleaner consisting of a mixture of petroleum solvent and surface active agent is used as a soak tank, and then followed by a rinse with high impact water sprays or steam jets.

Regardless of the cleaning method used it is essential to remember that cleaning is only the beginning of the long and difficult fight against corrosion. Once the parts are cleaned they must be dried, preserved and packaged so that the labor involved in machining, heat treating, finishing and cleaning will not go to waste. But cleaning is basic, for the finest known methods of preservation and packaging are useless when applied over a contaminated surface. You're leading with your chin when you start wrapping before you've certain all possible rust sources have been eliminated. Don't do it.

Electrolytic Analysis of Strike Solutions

By R. A. SCHAEFER¹ and J. B. MOHLER²

Abstract

A new cell and a rapid method of determining the approximate cathode current efficiency of silver strike baths were developed. The cell was easily reproducible. The cathode efficiency and the deplating time were directly proportional to the silver cyanide concentration. Increasing the bath temperature increased the cathode efficiency. Appreciable quantities of various sodium and potassium salts can be present in the silver strike solution without seriously affecting the test results. However, the presence of colloids must be avoided as they give rise to errors amounting to as much as 50%. The behavior of the copper strike solution was found to be similar to that of the silver strike solution.

Introduction

THE application of a metal strike in electroplating is an important step in obtaining good adhesion between basis metal and a heavy electrodeposit. The strike is usually operated at a low cathode efficiency so that the copious evolution of hydrogen will surface-clean the work prior to plating. This is one of the principal functions of a metal strike.

The standard methods of coulometer control of cathode efficiency are not adaptable for simple strike solution control. The cathode efficiency of the strike bath depends very much upon temperature, current density and bath composition.

We have found, however, that the amount of metal deposited on the test specimen from a strike solution is proportional to the time at constant temperature and constant current density. This quantity of metal may be determined either by weighing the deposit or, more conveniently, by measuring the deplating time and using this as a measure since the anode efficiency is very close to 100%. We found excellent correlation between these two methods. During deplating a drop in the current marks the end-point, which is analogous to an electrolytic thickness analysis.³

Apparatus

A dip-type cell was constructed similar to a conductance cell⁴ except that three electrodes were used instead of the conventional two electrodes. The commonly used platinum electrodes gave a rather indefinite end-point. Stainless steel proved equally inadequate because of severe anode corrosion in cyanide solutions. The most convenient and, at the same time, the best material for electrode construction proved to be "SAE-1010" cold-rolled steel.⁵ Some difficulty was encountered with these cells in obtaining check results on the same solution because of an indefinite end-point. It was later found that colloid materials in general contributed to this phenomenon and that it was probably due to the formation of minute quantities of colloid ferric hydroxide. However, check results are readily obtained if the electrodes are stored in 5% NaOH solution and if the solution in the dip-type cell is used only once. A cross-section and detail of this cell are shown in Fig. 1.

In order to obtain maximum accuracy, the cells must be standardized with known solutions, since it is very difficult to reproduce the exact area of the electrodes from cell to cell.

For convenience, an instrument box was made containing a rheostat, an ammeter, a reversing switch (No. 1, Fig. 2), and a short-circuiting

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³S. Anderson and R. Manuel, "An Electrolytic Chromium Plate Thickness Tester," Trans. Electrochem. Soc. **78**, 373 (1940).

⁴F. H. Getman and F. Daniels, "Outlines of Theoretical Chemistry," p. 5, 5th Edition, John Wiley and Sons, New York City (1931).

⁵C, 0.05% to 0.15%; Mn, 0.3% to 0.6%; P, 0.045% max., S, 0.045% max.; Fe, balance.

⁶The exact current used in apparatus shown in Fig. 2 was 0.118 amp.

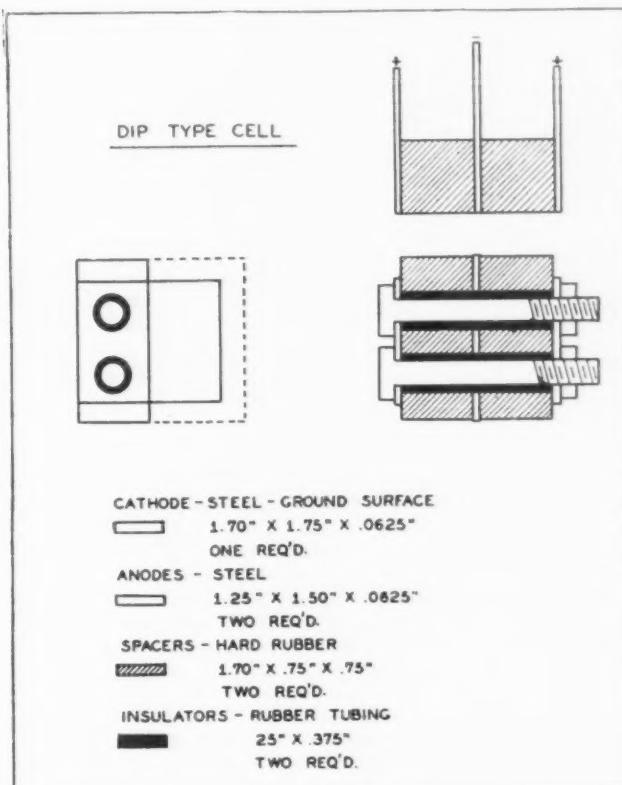


Fig. 1. Cross-section and plan view of dip-type cell.

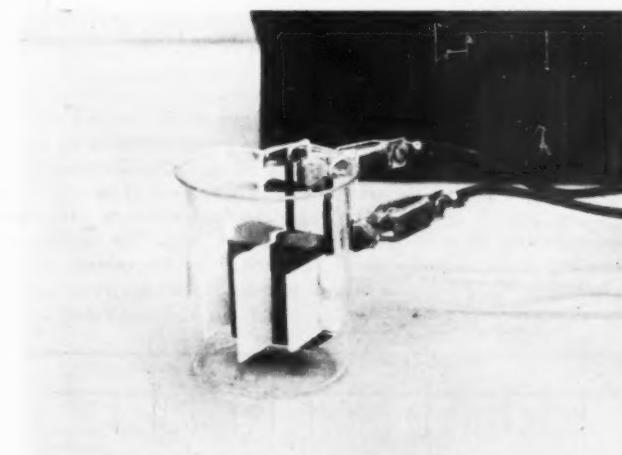


Fig. 1a. Close-up of dip cell.

switch (No. 2, Fig. 2). Adequate insulation of the wires leading to the electrodes of the dip-cell is a very important item because any current leaks in this high current density area will lead to error.

Silver Cyanide Strike Solutions

Experimental Procedure. Make the center electrode anodic, to remove any silver films from either a prior run or immersion plate, and set rheostat for exactly 1 amp. Close switch No. 1, making the center electrode cathode, and plate for exactly 1 min. at exactly 1 amp. Short circuit switch No. 1 and set rheostat so that 0.10 amp. will flow on deplating.⁶ Make the center electrode anodic and measure

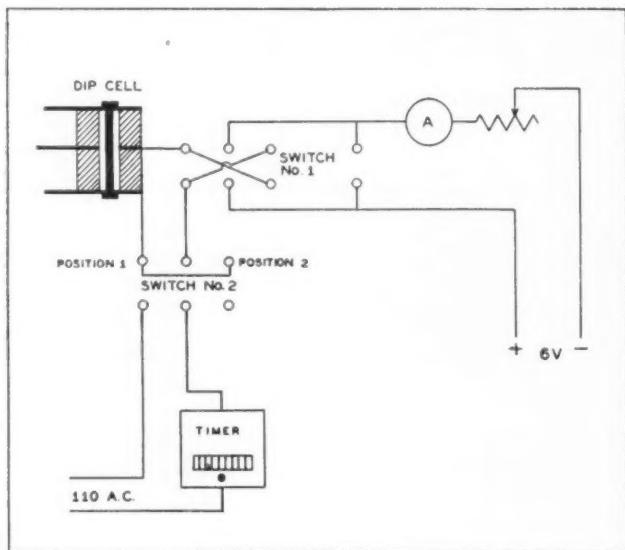


Fig. 2. Electric circuit.

the deplating time. At the end of this time the deplating current in the circuit will suddenly drop from 0.100 amp. to 0.08 amp. at which point the silver will be all depleted and the anode polarization will increase rapidly.

The reproducibility of the dip-type cells was studied by constructing three identical cells and checking each one with the same silver strike solution. The average results for a number of determinations are shown in Table I. The silver strike solutions were freshly prepared and were filtered prior to use. They contained 40 g./L sodium cyanide.

TABLE I

Three Cells Compared. Bath Temperature 25° C.

Silver Cyanide	Deplating Time		
	Cell No. 1	Cell No. 2	Cell No. 3
0.5 g./L	0.18 min.	0.18 min.	0.18 min.
1.0	0.30	0.32	0.30
1.5	0.43	0.44	0.43

In Table II are shown the average results of the plating and the deplating times with varying silver cyanide concentrations in freshly prepared and filtered baths containing 40 g./L NaCN.

In Fig. 3 is plotted the silver cyanide content of the bath *vs.* the deplating time in minutes. The deplating time varies in direct proportion to the silver cyanide content of the bath. The efficiency of the silver strike solutions decreases rapidly as the current density is increased. This is very well illustrated in the graph of plating current *vs.* deplating time, Fig. 4.

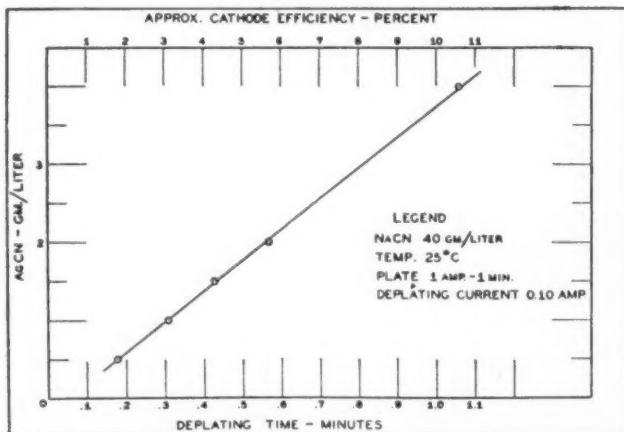


Fig. 3. The variation of cathode efficiency with change in metal concentration.

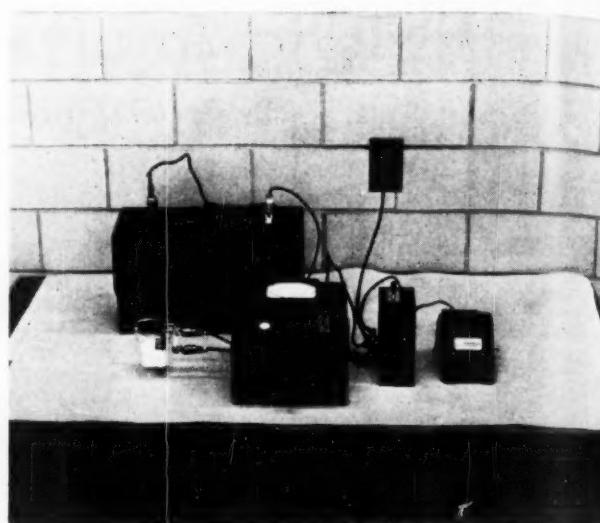


Fig. 2a. Complete apparatus.

TABLE II

*Effect of Varying the Silver Cyanide Concentration.
Bath Temperature 27° C.*

Silver Cyanide Conc'n.	Plating Time	Deplating Time
0.5 g./L	1.00 min.	0.18 min.
1.0	1.00	0.30
2.0	1.00	0.59
2.0	0.50	0.33
2.0	0.25	0.18
4.0	1.00	1.10
4.0	0.50	0.59
4.0	0.25	0.34

TABLE III

*Bath: Sodium Cyanide, 40 g./L; Silver Cyanide, 1 g./L;
Temperature, 23° C.*

Addition Agents	Deplating Time
None added	0.28 min.
Starch 1 g./L	0.36
Tergitol 4 drops/L	0.36
Gelatin 1 g./L	0.42
Soap 1 g./L	0.42

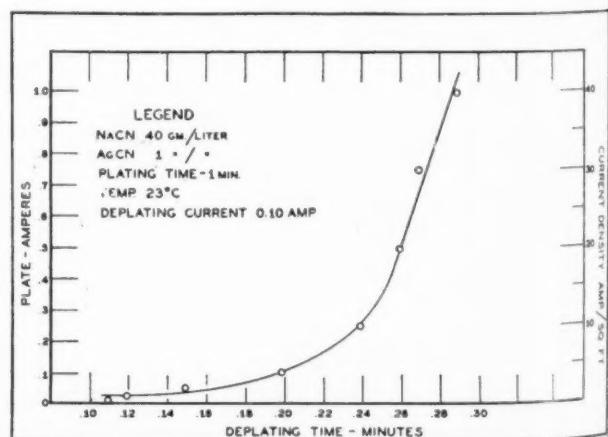


Fig. 4. The variation of deplating time with current density.

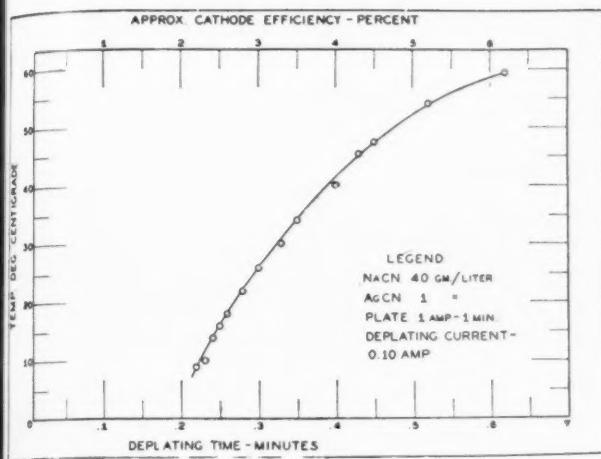


Fig. 5. The variation of cathode efficiency with change in temperature.

The presence of colloids in the strike solution has a pronounced effect on the deplating time. The deplating results are unreliable in the presence of colloids, as indicated in Table III.

The temperature coefficient⁶ for the temperature range investigated is approximately 1.23 per 10°C . A plot of the temperature versus the deplating time is shown in Fig. 5. The higher the temperature, the greater the silver ion mobility.

Effect of Foreign Salts in the Bath

In order to ascertain the value of this method of determining the cathode efficiency, we studied it under various conditions met with in the commercial applications of silver strikes. The following facts were established:

1. The results were identical whether distilled water or tap water was used provided the silver strike solution was filtered clear.
2. Boiling the silver strike solution did not change the plating rate.
3. Colloids affect the end-point in deplating.
4. None of the following chemicals, present in substantial amounts, affected either the plating or deplating rate: (a) sodium carbonate, (b) excess sodium cyanide, (c) sodium ferrocyanide, (d) sodium hydroxide, (e) activated charcoal (f) potassium salts in place of sodium salts, (g) ammonium hydroxide, (h) various bath impurities which accumulate in commercial plating.
5. Solutions one month old plated at the same rate as a fresh solution.

The data for the silver strike bath have been found to check the

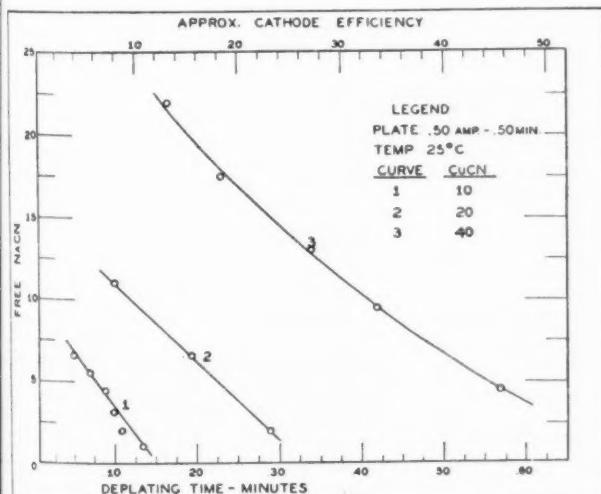


Fig. 6. The effect of copper and free cyanide on the cathode efficiency.—NaCN and CuCN concentrations in g./L.

⁶The formula may be written: $\frac{\text{Time } t^{\circ}\text{C}}{\text{Time } (t^{\circ} \cdot 10^{\circ})\text{C}} = 1.23/10^{\circ}\text{ C.}$

⁷Colin G. Fink and Raymond H. Lester, "The Electrodeposition of Indium from Sulfate Baths," Trans. Electrochem. Soc. **78**, 349 (1940).

⁸M. R. Thompson, "The Constitution and Properties of Cyanide Plating Baths," Trans. Electrochem. Soc. **79**, 417 (1941).

equation of Fink and Lester⁷ for the quantitative evaluation of the relationship between the metal deposited and the amount of hydrogen deposited. Within the limits of experimental error, the temperature and composition of the plating bath being constant, the data for the silver strike will follow the general equation:

$$\log (1-e) I_m \log eI = b$$

where: m and b are constants

e is the current efficiency

and: I is the current density

The probable per cent error taken from the curve is approximately 5%. The method is applicable and successful for the rapid check and control of silver strike solutions. The method can be applied to the more concentrated silver cyanide baths by dilution of the test sample with sodium or potassium cyanide.

Copper Cyanide Strike Solutions

Experimental Procedure. The procedure used for the copper cyanide solutions was similar to that for the corresponding silver solutions except that a plating time of one-half minute and a plating rate of one-half ampere were used. The deplating rate was 0.20 amp., with 0.18 amp. used to mark the end-point.

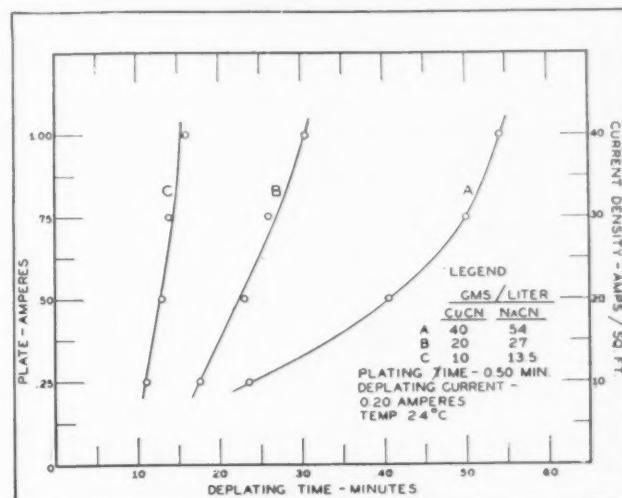


Fig. 7. The variation of cathode efficiency with deposition rate of the copper cyanide strike.

TABLE IV

Variations in Deplating Time vs. Cyanide Concentrations.
Bath Temperature, 25°C .

Copper Cyanide	Total Sodium Cyanide	Free Sodium Cyanide	Deplating Time
10 g./L.	12.1 g./L.	1.1 g./L.	0.135 min.
10	13.2	2.2	0.11
10	14.3	3.3	0.10
10	15.5	4.5	0.09
10	16.6	5.6	0.07
10	17.7	6.7	0.05
20	24.2	2.2	0.29
20	28.6	6.6	0.195
20	33.2	11.0	0.10
40	48.4	4.6	0.57
40	52.8	9.0	0.42
40	57.2	13.4	0.34
40	62.0	18.2	0.23
40	66.4	22.6	0.165

The testing of copper cyanide solutions is more complex than the testing of corresponding silver solutions because the rate of copper deposition varies with the free cyanide.⁸

Therefore, it is necessary to determine the free cyanide by standard analytical procedure before the copper concentration can be taken from the plating and deplating graphs. In Table IV are shown the (Concluded on page 503)

ANODIZING ALUMINUM

A Patent History and Digest

By GEORGE B. HOGABOOM

Consultant, New Britain, Conn.

U. S. Patent 1,771,910. July 29, 1930. D. Bengough & J. Stuart (England).

3% chromic acid; 40°C.; carbon cathode. In the first 15 minutes gradually increase pressure until 40 volts is obtained. Hold at 40 volts for 35 minutes. Increase voltage gradually (in 5 minutes) to 50 volts. Hold at 50 volts for 5 minutes. Total time 60 minutes. Current density not given.

U. S. Patent 1,869,041. July 26, 1932. Helmer Bengston, assigned to Aluminum Colors Inc.

Sulphuric acid 60-77%
(preferably 64-65%)

12 volts; 6-10 amp./sq. ft.; Temperature 20°-30°C.; Time 10-60 minutes.

110 volts 60 cycle a.c. can be used with a transformer. As little as 8 volts will give good coatings. The coatings can be treated with oil, paint, and dyes, and can be buffed.

NOTE: The dyeing of anodized coatings was patented by F. B. Flick and assigned to Aluminum Co. of America. See U. S. Patent 1,526,127. February 10, 1925.

U. S. Patent 1,869,042. July 26, 1932. Helmer Bengston, assigned to Aluminum Colors Inc.

The methods given are practically the same as in U. S. Patent 1,869,041. The "invention relates to a process . . . to provide aluminum and its alloys with a decorative . . . coating . . ."

NOTE: In No. 1,869,041 applied for June 11, 1930, Serial No. 460,543, reference is made to a copending application, Serial No. 463,351, which was filed 12 days later and which was renewed almost 2 years later. Both patents issued the same day in 1932. Apparently No. 1,869,041 was not issued when first allowed as Bengough-Stuart patent covered production of an oxide film on aluminum. While Bengough-Stuart mentioned application of oils and dyeing they did not apply for a patent to cover a "decorative" coating on aluminum. This was the claim of Bengston in No. 1,869,041. It is of interest to note that Bengough-Stuart had been granted a patent in England (No. 223,995. November 3, 1924) for coloring aluminum.

U. S. Patent 1,869,058. July 26, 1932. C. H. R. Gower (England), assigned to Aluminum Colors Inc.

This patent was applied for on October 29, 1931. An application was made in Great Britain October 20, 1927. No record can be located of that patent being granted. Bengough and Stuart's two patents had been granted in England for anodizing and for coloring on November 3, 1924.

The only difference between the process used in this patent and Bengston's No. 1,869,041 is the use of an electrolyte of lower

sulphuric acid content; 15-35% against 64-65%. The lower concentration of acid has been generally used in this country.

U. S. Patent 1,891,703. December 20, 1932. H. Bengston, assigned to Aluminum Colors Inc.

This patent covers the use of a gas, preferably air, to agitate a solution of sulphuric acid, chromic acid or any organic acid so as to obtain a more uniform coating of oxide on anodically treated aluminum or its alloys.

U. S. Patent 1,900,472. March 7, 1933. Martin Tosterud, assigned to Aluminum Colors Inc.

Sulphuric acid 5-12%
Temperature 20°-35°C.

Using a 7% sulphuric acid solution, a pressure of 20 volts is applied for 30 minutes.

NOTE: In this patent and in patents Nos. 1,869,041, 1,869,042 and 1,869,058 the concentration of the sulphuric acid is covered from 5% to 77%. All are assigned to Aluminum Colors Inc. The earliest expiration date is July 26, 1949.

U. S. Patent 1,946,147. February 6, 1934. H. Bengston, assigned to Aluminum Colors Inc.

A method for decreasing the porosity and absorptive capacity of an anodized coating on aluminum by immersing in water at 80°-100°C. for 10-30 minutes.

U. S. Patent 1,946,151. February 6, 1934. J. D. Edwards, assigned to Aluminum Co. of America.

Increasing the protective properties of an anodized coating on aluminum produced by the sulphuric acid process, by treating the anodized aluminum in a 1% to 10% chromic acid solution, at 20°-50°C., for 1-10 minutes. The best results were obtained in a 10% chromic acid solution at 35°C. for 20 minutes.

U. S. Patent 1,946,152. February 6, 1934. J. D. Edwards, assigned to Aluminum Co. of America.

Treating anodized coatings on aluminum or its alloys in the same manner as described in patent No. 1,946,151, except that the chromic acid solution temperature is increased from 20°-50°C. to 80°-100°C.

U. S. Patent 1,946,153. February 6, 1934. J. D. Edwards, assigned to Aluminum Co. of America.

To increase the resistance of an anodized coating on aluminum produced by any method the treated article is immersed in a solution of a soluble silicate, e.g. sodium or potassium silicate.

The solution used contains about 5% of silicate having a silica to soda ratio of about 3.25:1. The solution is operated at boiling

temperature, the time of immersion being 30 minutes. In the treatment described, the anodized coating was produced in a sulphuric acid electrolyte.

U. S. Patent 2,018,388. October 22, 1935. Martin Tosterud, assigned to Aluminum Colors Inc.

The coloring of anodized coating on aluminum by immersing in a solution of metallic salts. A black color can be produced by two methods:

1. Immerse oxide coated aluminum in a solution of either cobalt acetate, nitrate or chloride and then in a solution of ammonium sulphide.

2. Immerse oxide coated aluminum in a solution of nickel acetate and then in a solution of ammonium sulphide. Brown, red, yellow, blue, orange or green can be produced in a solution of the salts of other metals. Examples are cited.

U. S. Patent 2,040,617. May 12, 1936. R. B. Mason and M. Tosterud, assigned to Aluminum Co. of America.

A method of producing bright surfaces of aluminum. The reflecting surface of a "reflector" is buffed and given the following anodic treatment:

Chromic acid 1.0 to 25%
Hydrofluoric acid 0.2 to 15%
Current density 20-140 amp./sq. ft.
Temperature 30°-70°C.
Time 5-30 minutes.

The reflecting surface of the aluminum has a reflectivity of 87.2% after this treatment.

The aluminum is then anodically oxidized in a 7% sulphuric acid solution at a temperature of about 25°C. using a current density of about 12 amp./sq. ft. and a voltage of 20-22 for 10 minutes.

The article is then immersed in boiling water for 10 minutes after which it is buffed to a high lustre. The reflectivity is now about 85.3%. The finished surface can be washed or wiped without deterioration of the reflecting power.

U. S. Patent 2,040,618. May 12, 1936. R. B. Mason and M. Tosterud, assigned to Aluminum Co. of America.

A method of producing bright surfaces of aluminum by using sulphuric acid and hydrofluoric acid previous to anodizing in the sulphuric acid electrolyte.

Sulphuric acid 1-60%
Hydrofluoric acid 0.2 to 15%
Current density 10-100 amp./sq. ft. d.c.
Temperature 30°-70°C.

Alternating current can also be used although details not given. Sulphuric and oxalic acids can be used (no details). The above is stated to be the cleaning method. This is followed by anodizing in a 7% sulphuric acid electrolyte as in patent No. 2,040,617.

U. S. Patent 2,066,327. January 5, 1937. R. W. Buzzard.

Chromic acid 9%
Chromium acetate 10-20%
30-40 volts for 30-60 minutes according to thickness of film desired. Best results obtained with air agitation.

U. S. Patent 2,085,002. June 29, 1937. R. W. Buzzard.

Chromic acid 3-5%
Potassium dichromate 1-5%

Several methods of operation are given.

1. Raise pressure in 5 minutes to 40 volts. Hold for 5 minutes. Lower pressure to 35 volts in 5 minutes. Hold for 10 minutes. Lower pressure to 30 volts in 5 minutes. Hold 25-30 minutes.

2. Raise pressure as quickly as source of power will permit, or as slowly as operator desires, to 40 volts and hold for 30 minutes. Better results will be obtained up to 60 minutes. In this method a 10% chromic acid solution is employed at 35°-45°C.

U. S. Patent 2,108,603. February 15, 1938. R. B. Mason, assigned to Aluminum Co. of America.

This is another method of producing a reflecting surface on aluminum. See patents Nos. 2,040,617 and 2,040,618.

Example:

Hydrofluoric acid 2.5%
Current density 20 amp./sq. ft. d.c.
Temperature 31°-33°C.

Voltage 10-12.

Time 10 minutes.

Alternating current can be used.

Example:

Hydrofluoboric acid 2.5%
Current density 20 amp./sq. ft. d.c.
Temperature 31°-33°C.

Voltage 10-12.

Time 10 minutes.

Alternating current can be used.

Example:

Hydrofluoboric acid 0.8%
Current density 20 amp./sq. ft. a.c.
Temperature 22°-30°C.

Voltage 8-11.

Time 10 minutes.

After any of the above treatments, the article is anodized in a 7% sulphuric acid electrolyte and then immersed in boiling water for 15 minutes. This is followed by a light buffing. The reflecting surface of articles given a d.c. treatment was 85%; with a.c. treatment 79%.

U. S. Patent 2,153,060. April 4, 1939. J. M. Guthrie, assigned to Aluminum Co. of America.

The patent of R. B. Mason (No. 2,108,603) is discussed. It is stated that, after the anodizing treatment in the solutions of Mason, there is a superficial surface film or deposit which must be removed mechanically before the article is immersed in the hot water bath.

In this patent a solution of 20 parts of sodium carbonate and 15 parts of sodium dichromate in 1000 parts of water is used as a dip to remove the smudge forming film or deposit from the surface of the brightened aluminum produced by Mason's method. The temperature of this dip is 70°-95°C. The ar-

ticle or the solution is agitated during the immersion period of about 2 minutes.

U. S. Patent 2,126,954. August 16, 1938. J. D. Edwards, assigned to Aluminum Co. of America.

To stabilize the anodic coating on aluminum so that the whiteness of the coating will be more permanent, so that the reflecting power of a bright surface will last longer, and, so that the oxide coating will withstand high temperatures without crazing or cracking, an anodized article is treated with a solution of an alkali metal phosphate. Sodium, potassium or ammonium phosphate of either the primary, secondary or tertiary types are used.

The temperature of the phosphate solution can range from room temperature to 100°C. The preferred range is from 75°-100°C. Satisfactory results can be obtained in 15-30 minutes but shorter or longer periods of time can be used.

U. S. Patent 2,157,155. May 9, 1939. H. K. Work, assigned to Aluminum Co. of America.

A self lubricating surface on aluminum can be produced by applying a finely divided graphite, e.g. "Aquadag," dispersed in an aqueous solution of an alkali silicate, e.g. sodium silicate, to an artificially produced dense, hard, adherent coating of aluminum oxide.

This coating can be obtained by subjecting the aluminum article, e.g. a piston of an internal combustion engine, to a process consisting of treating the article as the anode in a 15% sulphuric acid solution at 75°F. and a current density of 11-12 amp./sq. ft. (23 volts) for 30 minutes.

The lubricating mixture is prepared by making a 25% solution of sodium silicate, having a ratio of silica to soda of about 3.25 to 1, and a finely divided deflocculated graphite, by diluting concentrated "Aquadag" with 3½ volumes of water, and mixing one part of the solution with two parts of the dispersion. This mixture is painted on an article, e.g. a piston, allowed to dry in air and then heated for one hour at a temperature of 110°C.

U. S. Patent 2,146,838. February 14, 1939. J. W. Newsome and J. D. Edwards, assigned to Aluminum Co. of America.

A non-electrolytic method for producing a substantially colorless, hard, adherent and absorptive coating on aluminum. The treatment is carried out in a sodium aluminate solution containing any one of the class of stabilizers comprising tannic acid, oleic acid, glucose, glycerine and silicates. The article to be coated is immersed in the stabilized solution at 70°-100°C. for 20 minutes.

The solution may consist of 0.2-6% of sodium aluminate, and sodium silicate in an amount equal to about 1-2% of the sodium aluminate present.

U. S. Patent 2,146,839. February 14, 1939. J. W. Newsome and J. D. Edwards, assigned to Aluminum Co. of America.

This patent is a continuation of No. 2,146,838, covering a non-electrolytic method for producing an oxide coating on aluminum. In this patent the stabilizing substance is selected from a group consisting of glycerine

and glucose in a solution of 0.2-6% sodium aluminate.

U. S. Patent 2,146,840. February 14, 1939. J. W. Newsome and J. D. Edwards, assigned to Aluminum Co. of America.

This patent is a continuation of No. 2,146,838 and No. 2,146,839. The stabilizing substance is tannic or oleic acid in a 0.2-6% solution of sodium aluminate. The process is also non-electrolytic.

U. S. Patent 2,111,377. March 15, 1938. Fred A. Wales.

Anodizing aluminum-silicon alloys as well as aluminum is accomplished in a sulphuric acid electrolyte using alternating current. A 13% sulphuric acid solution is used. The A. C. is impressed at 9-12.5 volts for approximately 3 minutes after which the pressure is gradually increased to 24 volts for a period of 20 minutes. The temperature of the solution is 70°-74°F.

This process is especially adapted for anodizing pistons that are made of aluminum containing 12% silicon. The anodized coating is much harder throughout than a coating produced in the conventional way.

In the same length of time a coating on aluminum by this method, using A. C., is thicker than that produced in a conventional sulphuric acid solution and using D. C.—.000327" for D.C., .000746" for A.C. There are no data on the current density used. The source of A.C. is a transformer for 110 or 220 volts having a rated capacity of 200 amperes and 24 volts. Illustrations and detailed data on equipment used are in the description of the process.

U. S. Patent 1,735,286. November 12, 1929. Tsunetaro Kiyirai, Toyotama-Gori and Sakae Neki (Japan), assigned to Zaidan Hojin Rikagaku Kenkyujo (Japan).

Oxalic and malonic acid or their salts are used to produce an oxide coating on aluminum.

Example:

1. Oxalic acid 1.0-3.0%
60-100 volts alternating or direct current
Current density 0.45-0.27 amp./sq. ft.
Temperature under 30°C.
2. Malonic Acid 1.0-3.0%
60-100 volts alternating or direct current
Current density 0.45-0.27 amp./sq. ft.
Temperature under 30°C.

The claim is made that, in electrolytes of other composition, it is not possible to build up the anodic film to any desired thickness but that it can be done in either of the two electrolytes given.

U. S. Patent 1,735,509. November 12, 1929. Shoji Setch and Sakae Neki, (Japan), assigned to Zaidan Hojin Rikagaku Kenkyujo (Japan).

The anodizing is done in a solution of oxalic acid.

Oxalic Acid 1.3%
Direct current, 6-90 volts, upon which is superimposed alternating current, 60-120 volts. Diagram given.

Current density 0.45-1.8 amp./sq. ft.

In the discussion, serial No. 753,525 is referred to in which A. C. alone is used. The A. C. causes local attack of the aluminum as it is treated. The superimposing of A. C. on the D. C. overcomes the pitting and local attack of the article.

U. S. Patent 1,965,684. *July 10, 1934.* H. K. Work, assigned to Aluminum Co. of America.

The oxalic acid solution is used in this patent. It is stated that the trouble experienced in the Setch-Sakae process—No. 1,735,509 is not eliminated by superimposing A.C. on D.C. but is due to the concentration of the solution used.

Direct current can be used and the aluminum article will not be pitted or attacked.

Oxalic acid 5-9% by weight
25-40 volts

Current density not given

Time 60 minutes

Temperature 71°-106°F.

In Work's method no cooling coil is necessary as the increase in temperature of the solution is within limits that do not affect operation of the bath or the character of the anodized coating.

U. S. Patent 2,161,636. *June 6, 1939.* W. K. Rankin and J. R. Grossman, assigned to General Electric Company.

The claim is made that this process is an improvement upon all other processes in which an alkali silicate is used to obtain a better anodized coating on aluminum.

The aluminum to be treated is cleaned in a hot solution of sodium hydroxide, 1-20%, rinsed in water and then immersed, to remove excess alkali, in a dilute solution of nitric acid to which ammonium thiocyanate has been added. A 20% by weight nitric acid solution can be used but the amount of ammonium thiocyanate is not given. After rinsing the article in clean water it may be anodized in several ways.

1. Hot solution of sodium carbonate and alkali chromate.
2. Sulphuric or chromic acid solutions.
3. Sulphuric and oxalic acid solution.

The preferred solution is:

Oxalic Acid 3 parts by weight
Distilled water 97 parts by weight
Current density 4 amp./sq. ft.

Temperature below 40°C. (preferably 30°C.)

Voltage 60-70

Time 30-120 minutes

The aluminum article is washed with water and then placed in an electrolytic bath comprising an aqueous solution of an alkali metal silicate, e.g. sodium silicate in which the silica to soda ratio is preferably 2.7:1. The article is made the anode in this solution and the voltage is raised gradually in steps above 60 volts to about 250 volts for 5 to 15 minutes. For films of increased insulating value 800 volts may be used.

U. S. Patent 2,279,252. *April 7, 1942.* C. J. Slunder, assigned to Aluminum Co. of America.

For refrigerator trays, etc., a sulphuric acid anodized coating on aluminum is impregnated with an aqueous solution of a material selected from the group consisting of substantially alkali neutralized sulfonated and sulfated fatty alcohols and the substantially organic base neutralized sulfonated and sulfated fatty alcohols. This can be a sodium salt of sulfated stearic alcohol. A solution containing 2 grams per liter and operated at boiling temperature will give the required results. Commercial products known under the trade names of *Gardinol*, *Avitex*,

Duponol, etc. produce satisfactory results. By using this process the objectionable odor of the anodized coating produced in a sulphuric acid electrolyte is eliminated—the treated coating is odorless.

U. S. Patent 2,294,717. *September 1, 1942.*

C. R. Carney.

A wax coating is applied to a surface of anodized aluminum. The coating material consists of a liquid containing one part, by weight, of a resinous wax and two parts of a liquid containing a mixture of 50% by weight of a mineral oil and 50% by weight of a paraffin oil. This is employed at a temperature of 150°-170°F. It is claimed that the wax coating is especially adaptable for refrigerator trays and grids.

U. S. Patent 2,331,071. *October 5, 1943.* Alfred Halvorsen, assigned to Boeing Aircraft Co.

A method of anodizing rivets in bulk in any conventional electrolyte. A positive contact is made of the rivets or other small articles to each other by placing the articles in a specially constructed container in which a pressure of 12½ lbs. per sq. in. can be applied to the mass.

In commercial operation the amount of improperly anodized rivets is 1% or less and never in excess of 2%. Details of construction of the container are given.

U. S. Patent 1,526,127. *February 10, 1925.*

F. B. Flick, assigned to Aluminum Co. of America.

A process to provide a commercially practical method of forming on aluminum a dense, adherent coating of aluminum oxide combined with a coloring substance, e.g. a lake forming dye.

Solution:

Aqua ammonia or ammonium sulphide	2-25%
Voltage required in excess of 150	
Current density at the start 12	
amp./sq. in., which drops in 2	
minutes to 2.5 amp./sq. in.	
Temperature 30° to 90°C.	

It is of interest to note that, in the only legal suit in this country (Aluminum Co. of America vs. Colorall Process), this patent was upheld for the coloring of aluminum oxide anodized films.

The application for this patent was made July 10, 1923. In England, Bengough and Stuart made application for a patent to color aluminum oxide films on August 2, 1923. The Flick patent expired on February 10, 1942.

U. S. Patent 2,231,086. *February 11, 1941.* Alwin Muller and J. Korpium (Germany), assigned to Sherka Chemical Co., Inc.

An aqueous acid bath containing a soluble complex acid with a heavy metal, having more than one stage of oxidation in the anion, and leaving also a negative element other than oxygen in the anion, that does not undergo decomposition under the influence of the electric current and that does not react with the electrode metal.

Sulphuric acid (concentrated)	100 gms/liter
Manganese sulphate (crystallized)	100 gms/liter
Alternating current	15-25 volts
Current density	20-30 amp./sq. ft.
Temperature	80°F.
Time 12 minutes for coating 0.0001"	thick.

U. S. Patent 2,233,785. *March 4, 1941.* J. Korpium (Germany), assigned to Sherka Chemical Co., Inc.

An electrolyte of one of the sulphonated acid groups is used, e.g., phenol-sulphonated acid. Seven compounds are listed. Each compound requires different electrical and temperature conditions to obtain a coating on aluminum.

U. S. Patent 2,231,373. *February 11, 1941.* Max Schenk (Switzerland), assigned to Emetal Electrochemical Corp.

The salts of titanium are used for the electrolyte to produce an anodized coating on aluminum. These salts are expensive and cannot be obtained in quantities that would make their use economical for commercial production. The sealing of the oxide coating is done in a solution of diisopropylnaphthalene-sulfonic acid or laurylsulfonate.

U. S. Patent 2,260,278. *October 21, 1941.* Max Schenk (Switzerland), assigned to Emetal Electrochemical Corp.

In claim No. 1 the use of zirconium is advocated. "In the production of opaque, hard, protective coatings on articles of aluminum and aluminum alloys the step of subjecting an article to be treated as an electrode to the action of an electric current in an aqueous bath consisting of a solution of zirconium-sodium oxalate, boric acid, crystallized borax and dextrine."

U. S. Patent 2,262,967. *November 18, 1941.* Max Schenk (Switzerland), assigned to Emetal Electrochemical Corp.

Aluminum articles are immersed in an electrolytic bath containing a salt of thorium and are subject to either alternating current or as anode with direct current. The thorium salts furnish the cations while both organic and inorganic substances derived from strong mineral acids are used as anions.

U. S. Patent 2,324,106. *July 13, 1943.* Ralph E. Petit, assigned to Aluminum Co. of America.

One claim: "A method of ornamenting an aluminum surface which consists in providing said surface with contrasting sandblasted and relatively smooth areas, anodically treating said surface in a brightening electrolyte to brighten said contrasting areas and thereafter applying to said surface a protective coating of aluminum oxide by anodic treatment."

British Patents

223,994. *November 3, 1924.* G. D. Bengough and John M. Stuart.

Improved process of protecting surfaces of aluminum or aluminum alloys.

223,995. *November 3, 1924.* G. D. Bengough and J. M. Stuart.

A process of producing a coloured surface on aluminum or aluminum alloys.

226,536. *October 8, 1925.* Zaidan Hojin Rikagaku Kenkyujo (Japan).

A process of electrolytically depositing an insulating coating or skin on aluminum.

413,814. *July 26, 1934.* Aluminum Colors Inc. (U. S. A.)

Improvements in or relating to methods of treating oxide coatings.

- 429,344. May 24, 1935. S. R. Sheppard. Improvements in and relating to anodic treatment of aluminum and its alloys. 466,941. June 8, 1937. V. Lichoff (Russia). An improved process for preparing an aluminum oxide layer by anodic oxidation.

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ELECTROLYTIC ANALYSIS OF STRIKE SOLUTIONS

(Concluded from page 499)

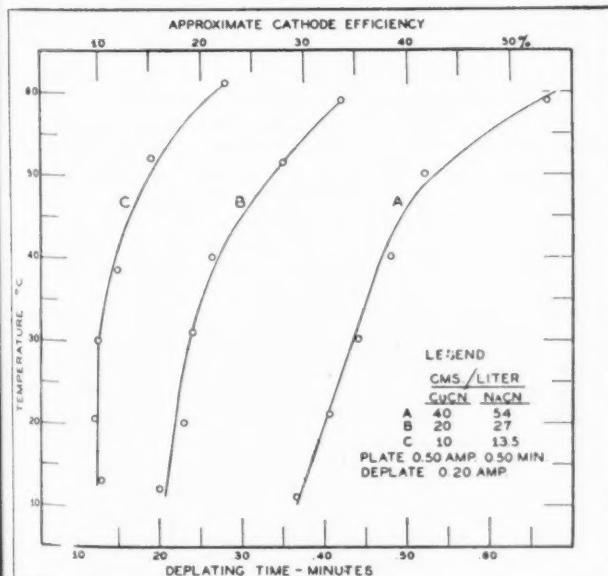


Fig. 8. The variation of cathode efficiency with temperature of the copper cyanide strike.

varyations of deplating time with various concentrations of free cyanide and of copper cyanide.

In Fig. 6 is a plot of these data. The deplating time and the corresponding cathode efficiency are greatly influenced by the free cyanide, in fact, considerably more influenced than by the variation of the metal content when keeping the free cyanide constant. Furthermore, these curves illustrate the well-known fact that if the free cyanide is increased sufficiently, copper will not deposit under normal plating conditions.

The cathode efficiency decreases as the current density is increased, with the metal deposit approaching a constant with increased current density.

A typical graph of plating rate vs. deplating rate for copper with the cyanide strike baths is shown in Fig. 7. The plating rate varies with the operating temperature of the bath. The effect of this variable is given in Fig. 8.

In general, copper cyanide strike solutions are similar in their behavior to the corresponding silver baths as far as impurities are concerned. The copper baths must likewise be free of colloids. The plating rate of the copper bath is greatly influenced by the cyanide content of the bath, whereas the plating rate of the silver in the cyanide bath appears to follow the diffusion theory of Dole.⁹

⁹ Malcolm Dole, "Diffusion Theory of the Codeposition of Gold and Copper," *Trans. Electrochem. Soc.* 82, 241 (1942).

THIS IS WASHINGTON -

By George W. Grupp
METAL FINISHING's Washington Correspondent



Graham Addresses Baltimore-Washington Branch

ton Branch to hear Dr. A. K. Graham, the new Executive Secretary of the American Electroplaters' Society, deliver himself of an address on "Matters of Interest to the Electroplaters". In his address Dr. Graham stressed the importance of lifting the American Electroplaters' Society to a real scientific level. To attain this objective he said that the members should sell the Society by pointing out to prospective members and to others the accomplishments and values received from the Society's efforts. Then he told of the Society's ambition to place more emphasis on the quality of its publication content. He wants to see a complete set of the Society's publication in the library of every city where there is a branch AES. He made a plea for topics on subjects for articles which would plug the holes of plating knowledge. He said he wants material on the effect magnetism has on plating. He also wants articles on organic plating and on the peacetime plating requirements of electronics.

Research Fund Being Pushed

In an effort to swell the Research Fund, the Baltimore-Washington Branch has decided to replace its letter campaign with one of personal calls. In this way it believes it may secure a number of sizable sums.

Baltimore-Washington Branch Planning Big Annual Meeting

Ken Huston and Chairman Frank L. Davey of the Banquet Committee are planning to have a number of excellent speakers for the educational session and some lively entertainment for the banquet.

Plating Plant to Be Visited By Baltimore- Washington Branch

The December meeting of the Baltimore-Washington Branch will be a tour of inspection of the plating facilities of the American Hammered Piston Ring Division of Koppers Company in Baltimore. Dinner will be served in the company's restaurant.

Huston Is Now With Rustless Iron and Steel Company

years of service with the Western Electric Company as Finish Engineer in its Special Products Shop in Baltimore, has resigned to accept the position of Research Chemical Engineer of the Rustless Iron and Steel Company of Baltimore. In his new position Mr. Huston will make studies of corrosion, electroplating, electrolytic polishing, and of coatings and surface finishes on stainless steels.

In spite of the street-car and bus strike in Washington, a goodly number turned out for the November meeting of the Baltimore-Washing-

Materials and Production Control Orders Reduced to 52

When the War Production Board passed out of existence on November 3, 1945 and the Civilian Production Administration took over, only 52 of the one-time 650 orders remained in force. Those in force and relating to the metal finishing and organic finishing industries are Chemical Order M-300; Lead Order M-384; Rosin Order M-387; Glass Container and Closure Order L-103; Tinplate Order L-103-B; Corundum Ore Order M-89; General Scheduling Order M-293; Lead Order M-38; Tin Order M-43; Antimony Order M-112; and Tinned and Detinned Scrap Order M-325. The Priorities Regulations which are still in force are Priorities Basic Rules No. 1; Preference Rating Uses No. 3; Forms and Orders No. 5; Standard Certification No. 7; Preference Ratings and Quotas Transfer Procedure No. 7A; Report Filing Procedure No. 8; Reratings No. 12; Special Sales No. 13; Canadian War Agencies No. 14; Exports No. 15; Appeals Procedure No. 16; Post Exchanges No. 17; Canadian Deliveries No. 22; Experimental Models No. 23; CC Rating Policy No. 28; Blanket Revocation of Orders No. 31; and Inventory Controls No. 32.

Wage Increase Basis Laid Down by Truman

In Executive Order 9651 President Truman laid down three conditions under which wages and salaries may be made during the transition from wartime to peacetime economy. "A. Increases where the percentage increase in average straight time hourly earnings in the appropriate unit since January, 1941, has not equaled the percentage increase in the cost of living between January, 1941, and September, 1945. B. Increases necessary to correct inequalities in wage rates or salaries among plants in the same industry or locality, with due regard to normal competitive relationships. C. Increases necessary to insure full production in an industry, designated by the Stabilization Administrator, which is essential to reconversion and in which existing wage rates or salaries are inadequate to the recruitment of needed manpower."

Small Outlines Functions of CPA

The six functions of the Civilian Production Administration, which succeeds the War Production Board, as outlined by Administrator John D. Small, are "(1) To expand the production of materials which are in short supply and which are, or threaten to be, reconversion bottlenecks; (2) To limit the manufacture of products for which materials or facilities are insufficient; (3) To control the accumulation of inventories so as to avoid speculative hoarding and unbalanced distribution, which would curtail total production; (4) To grant priority assistance to break bottlenecks which threaten to impede the reconversion process; (5) To facilitate the fulfilment of relief and other essential export programs; and (6) To allocate scarce materials and facilities necessary for the production of low-priced items essential to the continued success of the stabilization program of the Government."

CPA to Retain Advisory Committees

Administrator John J. Small of the Civilian Production Administration has announced that his organization will continue the War Production Board's policy of industry-Government cooperation which served a useful purpose during the war. The CPA will consult with 176 key industry advisory committees such as the Gum Naval Stores Committee, Lead Pigment Manufacturers Committee, Marine Paint Manufacturers Committee, Natural Resins Importers Committee, Paint, Varnish and Lacquer Committee, Shellac Committee, Waxes and Polishes Committee, Wood Naval Stores Committee, Chromium Plated Tubular Furniture Committee, General Metal Office Furniture Committee, Metal Household Furniture Committee, Industrial Equipment Manufacturers Committee, Aluminum, Magnesium, Brass, Bronze, Copper, Corundum, Antimony, Platinum, Silver, Cadmium, Primary Lead and Zinc Committees.

Interior Department Wants to Recognize Increasing Dependence on Foreign Sources for Certain Metals

tin and zinc.

Bowles Wants Life of OPA Extended

of the Office of Price Administration beyond June 30, 1946. He told the House Appropriations Committee that if all price controls are dropped there will be an explosive rise in building material supplies, in key industrial materials, in many consumer durable goods, and in sweeping rent increases. "These increases," he said, "in the cost of living and business costs would mean another round of price and cost increases. The boom-and-bust spiral would be on."

Orinoco Indians Want Bright Metal Flashlights

will have none of the flashlights with casings made of heavy lacquered cardboard. They want brightly finished metal flashlights when they go out at 4:00 A.M. to tap rubber trees. This should be a feather in the cap of metal finishers.

New Commodity Specification Directory Issued

page book will be found a brief description of more than 35,000 different commodity standards and specifications formulated by trade associations, technical societies and industrial establishments. This book is of special interest to those making anything covered by Government specifications. It has a comprehensive index. And it gives the names and addresses of the standardizing agencies from which copies of the complete specifications can be obtained.

Income Tax Ruling on Terminated War Contracts

minated contracts to be settled. At the same time it was learned that the Commissioner of Internal Revenue has ruled that for companies not on a cash basis, all monies received as a final settlement of war work must be considered income in the tax year that the war contracts were terminated, no matter when the final payment is made. In other words, for taxable years ending after July 21, 1944, income and related deductions arising from terminations must be included in the return for the taxable year of the termination. If the return is filed before settlement has been effected, an estimate should be

used with subsequent adjustment in an amendment to the return. No amount should be treated as income from the contract termination when compensation is waived ("no-cost settlement"); related costs are deductible as ordinarily allowed under provisions of the Internal Revenue Code. Deductibility for tax purposes is not established by execution of an agreement.

Pamphlet on Production Scheduling Issued by WPB

The War Production Board issued during the latter part of October a pamphlet called "Time Lag for Procurement of Selected Items". This pamphlet, which may be obtained from the Civilian Production Administration, shows the average normal pre-war lag between the date of receipt of an order and the date of shipment on about 600 different items, the present lag, and the estimated lag when business has returned to normal. This pamphlet, WPB officials believe, will help manufacturers to schedule their production with a greater degree of accuracy; and that it will be particularly valuable to new manufacturers seeking components and substitute materials.

As Johnson Views the Future

Eric A. Johnson, president of the Chamber of Commerce of the United States, in an address before the Labor-Management Conference in Washington, among other things said: "If management and labor are going to stand up and slug it out, we are going to set the country back for many decades. But if we are going to sit down and think it out, unparalleled prosperity lies ahead."

Congress to Be Asked to Curb Irresponsible Labor Segments

Congress will be asked to pass legislation to curb irresponsible segments of labor if the Labor-Management Conference in Washington does not produce binding declarations from labor leaders.

Ickes Reports on War Production

Secretary of the Interior Harold L. Ickes announced that during the war we mined and produced 20,750 tons of tungsten, 112,000 tons of molybdenum, 2,278,000 tons of lead, 3,155,000 tons of potassium, 3,642,000 tons of zinc, 5,000,000 tons of copper, 14,169,000 tons of bauxite, 17,118,000 tons of sulphur, 68,000,000 tons of salt, 516,158,500 tons of iron ore, 1,000,000,000 tons of petroleum, and 3,061,060,000 tons of coal.

Over Two Million Industrial Accidents in 1944

John W. Gibson, Special Assistant to the Secretary of Labor, at a recent hearing held by a subcommittee of the Senate Committee on Education and Labor on Senate Bill 1271, stated that during the year 1944 the number of persons dying from work injuries totaled 15,900 as compared with 14,800 in 1939. He said that in 1944 there were 2,250,000 industrial injuries of which 1,700 are permanent disabilities; 94,000 are permanent partial disabilities, and 2,118,400 were temporary disabilities.

One Man Control of Proposed Scientific Research Opposed by Dewey

Before a recent hearing before a joint session of the Senate's subcommittees on Commerce and Military Affairs, Col. Bradley Dewey opposed a one-man control of the proposed Government program to aid scientific research. It is his opinion that such a Government project should be entrusted in the hands of a board of outstanding American scientists and engineers.

CPA May Put Additional Controls on Scarce Materials

The Civilian Production Administration has issued the warning that it may be forced to a wider use of the CC ratings if manufacturers and buyers do not distribute scarce materials more equitably.

SWPC Wishes to Expand Activities

have legislation passed which will permit it to make loans for purposes other than manufacturing. And it also wishes to have the power to arrange foreign procurements on behalf of small sub-contractors.

Blacklist to Continue Through Part of 1947

department until the middle of 1947. However, substantial progress has been made in reducing the number on the list.

Prompt Release of Scientific Data Sought

Because a tremendous amount of vital industrial and scientific information obtained from the Axis powers is

The Smaller War Plants Corporation is seeking to still being withheld, the American Chemical Society has addressed Director John W. Snyder of the Office of War Mobilization and Reconversion for the purpose of having developments and processes released promptly to Americans because such information is already being made available to our allies.

Commerce Department's Surplus Property Disposal Powers Transferred to RFC

from the Department of Commerce to Reconstruction Finance Corporation's Surplus Property Disposal Division.

OPA Relaxes Price Control on Many Items

On November 20, 1945, the Office of Economic Stabilization permitted the OPA to suspend and exempt from price

President Truman, on October 19, 1945, transferred the power of disposing of consumer goods

control many items such as pure nickel scrap, monel metal scrap, aluminum scrap, secondary aluminum ingot, mica, aluminum mill products, magnesium mill products, scientific instruments, and other items.

RFC Wants Buyers for its Surplus of Chemicals

Recently the RFC announced that it is prepared to sell a large quantity of chemicals such as 3,126,074 pounds of acetylene tetrachloride, 47,575 pounds of ammonium chloride in fine white crystals, and all kinds of acids, industrial alcohol, and caustic soda. Detailed lists may be obtained from regional offices of the Reconstruction Finance Corporation.

Dutch East Indies Tin Mines Expected to Begin Operations Soon

Information has been received at Washington that the tin mines of the Dutch East Indies will begin to operate as soon as the necessary electrical equipment is installed. This will ease the present shortage of tin. The present stockpile in this country is said to be about 30,000 tons.

Zinc Demand Is Lagging

The consumption of zinc is lagging behind the expected demand because of the slowness of the automotive and construction industries to accelerate reconversion for peacetime production.

Buffing and Polishing Wheel Prices May Be Increased

The Office of Price Administration, on October 23, 1945, authorized sellers of buff and polishing wheels made of cotton textiles to add to their ceiling prices the dollar and cents amount of their increase in the cost of textiles resulting from upward adjustments of textile prices. The authorization was provided for in Amendment No. 19 to Revised Maximum Price Regulation No. 136.

Glycerin Supply Healthy

According to figures recently released, the stock of glycerin on hand July 31, 1945 amounted to 59,504,000 pounds. And during August 1945 there was produced over 3,000,000 pounds of glycerin. If this trend continues it is believed that there is little chance of any real shortage developing in the future.

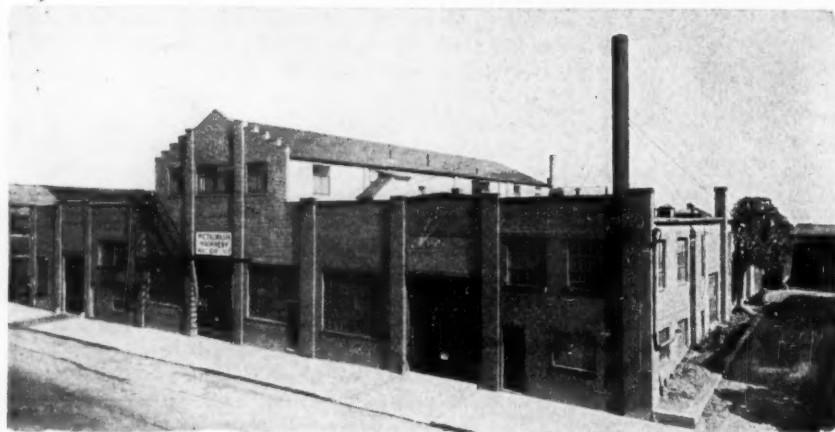
CPA May Grant Higher Tin Quotas

Recently about 18,000 tons of Japanese tin was found in the Malayas. This and a number of other factors are expected to result in an easing of the tin situation and the granting of higher tin quotas by the Civilian Production Administration.

Methanol Restrictions Removed

The War Production Board removed all restrictions on the production and distribution of methanol on October 31, 1945 by revoking Schedule 72 of Order M-300.

This Modern Plant produces



Metalwash Equipment for CLEANING · PICKLING · RUSTPROOFING · DRYING — for Serving Your Present Metal Cleaning requirements

Our 23 years experience in designing and building equipment for preparing metal surfaces for finishing, enables us to meet the exacting requirements of today for better, faster and more economical finishing.

— for Solving Your Future Metal Cleaning Problems

We maintain a competent Engineering and Research Staff which is constantly developing new methods and equipment. Our nation-wide sales organization is qualified to assist you in applying these developments to your problems. Write or phone.

METALWASH MACHINERY CO.

149-155 Shaw Ave.

Irvington 11, N. J.

When the Rods are RIGHT...



Your tanks STAY TIGHT!

There's no trick in keeping a new pickling tank tight.

But after the newness wears off, keeping it tight and leakproof depends on the tie-rods.

What's the test of a tie-rod?

Can yours be repeatedly drawn up? Do they maintain their holding power, and thus reduce repair and maintenance costs? Do they keep seams tight, and save you the trouble and expense of replacing acid lost through seepage?

You'll answer yes... if your tie-rods, nuts and washers are Monel.* For Monel is strong and tough; it provides exceptional resistance to corrosive pickling solutions.

Compare this performance

In tests undertaken by a large steel mill, Monel tie-rods remained smooth (and were only slightly discolored) after 2448 hours in a 5-7% sulfuric acid pickle at 180° F. Under identical conditions, two other commonly used tie-rod metals showed serious deterioration with only a core of original metal remaining.

Load tests after service revealed that the Monel rods had a greater than 3-to-1 strength advantage over both competitive metals. Furthermore, the condition of the threads on Monel rods was better; there was no significant attack ahead of the nut. In other words, full usefulness of the rods was preserved. Nuts could be tightened with-

out danger of stripping the threads or snapping the rods.

A valuable report for you

When you order new tanks... or find it necessary to re-rod those you have... you'll want to consider the many advantages of Monel tie-rods. We suggest, therefore, that you send for the informative report, *Summary of an Extensive Tie-Rod Test Program*. Its charts, drawings, tables, photographs and text bring you a lot of factual, helpful material. Write today for your copy. The International Nickel Company, Inc., 67 Wall Street, New York 5, N. Y.

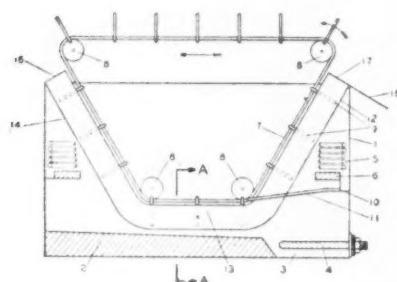
*Reg. U. S. Pat. Off.

Monel

Patents

Degreasing Machine

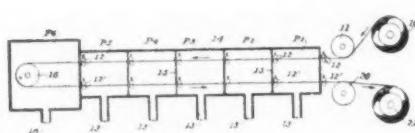
U. S. Pat. 2,385,860. W. F. Jesson (England), assignor to Imperial Chemical Industries, Ltd. (England), Oct. 2, 1945. Apparatus for treating metal and like non-absorbent articles with a volatile grease solvent, comprising, in combination, a vessel, a solvent degreasing zone in said vessel in which is retained, in both liquid and vaporous state, a volatile grease solvent, and through which



articles pass during their treatment in said vessel and degreasing zone, means for vaporizing said solvent, additional means for condensing the vaporized solvent when the vaporized material reaches a predetermined level in the degreasing zone of said vessel, means for returning condensate from said condensing means to the portion of the volatile solvent in said degreasing zone which is in liquid state, a trough disposed in said vessel, the extremities of said trough extending above said solvent degreasing zone, while the intermediate portion thereof lies within said degreasing zone, a conveyor arranged to pass along a path adjacent to the top of said trough, said conveyor being provided throughout its length with a plurality of spacedly-disposed, rigidly-mounted members shaped to occupy substantially the major portion of the cross section of said trough, said members during movement of said conveyor being adapted to forcibly charge articles through said trough and said degreasing and condensing zones.

Vacuum Metallizing

U. S. Pat. 2,384,500. C. C. Stoll, assignor to Crown Cork & Seal Co., Inc., Sept. 11, 1945. The method of coating in vacuum comprising continuously traveling material from



the atmosphere into and through a plurality of successive stages of reduced pressure in advance of a coating stage, the first stage being open to the atmosphere and the subsequent stages including the coating stage communicating consecutively, openly and directly with each other, maintaining the reduced pressure in each stage including the coating

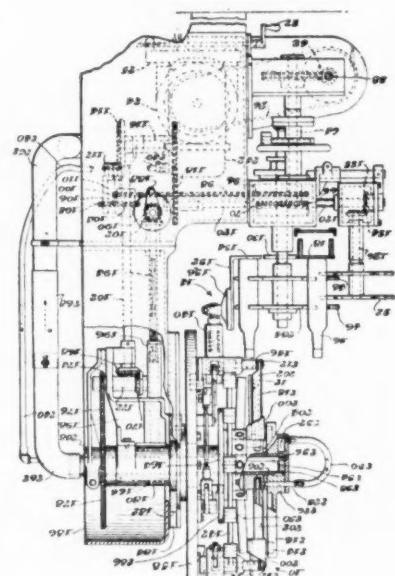
stage below the pressure of the immediately previous stage, maintaining the reduced pressure in said coating stage effective to assure removal of substantially all extraneous gases from the coating stage and the traveling material, and coating the material while it is traveling through said coating stage.

Plating on Beryllium Copper

U. S. Pat. 2,383,434. H. L. Hovis, assignor to Hamilton Watch Co., Aug. 21, 1945. A process for removing oxidation from beryllium copper alloy consisting in subjecting the alloy to a bath of 85% pure phosphoric acid at a temperature approximating 120° F. to produce a surface capable of being plated.

Container Cleaning Machine

U. S. Pat. 2,386,043. A. C. Everett, assignor to Pneumatic Scale Corp., Ltd., Oct. 2, 1945. In combination, a continuously rotating carrier rotated in a vertical plane and having a plurality of individual radially mounted container holding members capable of movement with respect to the carrier,



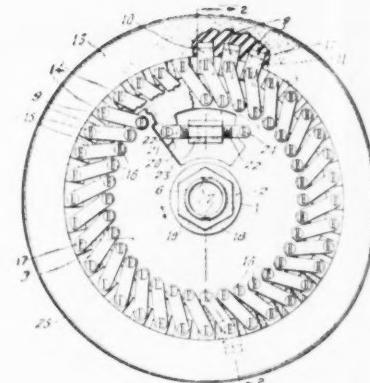
means for causing said holding members to travel in a substantially horizontal direction and in a straight line for a substantial distance beyond a vertical line passing through the center of said carrier, a supply conveyer, and means for transferring successive containers from said supply conveyer to said holding members during such horizontal straight line movement.

Pickling Inhibitor

U. S. Pat. 2,384,467. W. H. Hill, assignor to American Cyanamid Co., Sept. 11, 1945. An inhibitor composition for pickling ferrous metals comprising a non-oxidizing acid pickling solution and a condensation product of formaldehyde with the reaction product of hydrogen sulfide and a guanidine.

Abrading Wheel

U. S. Pat. 2,387,297. G. W. Rochwald, Oct. 23, 1945. An abrading wheel of the character described, comprising two coaxially relatively rotatable body sections, an expans-



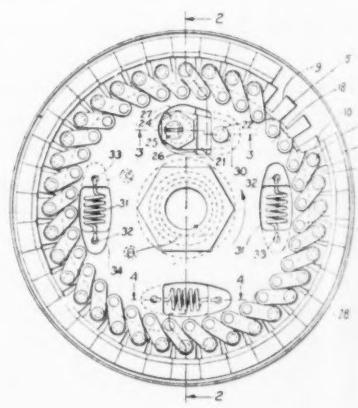
ible rim coaxial with said body sections, a plurality of thrust members radially slidably mounted on one of said body sections and each connected at its outer end to said rim, and a link pivotally connected to each thrust member and to the other of said body sections so that upon relative rotation of said body sections in opposite directions said links will be actuated longitudinally outwardly and inwardly respectively to expand and contract said rim, and an operating element for causing relative rotation of said body sections.

Detergent Briquette

U. S. Pat. 2,382,165. J. D. McMahon, assignor to The Mathieson Alkali Works, Inc., Aug. 14, 1945. A detergent briquette physically stable, hard, strong and non-deliquescent consisting of a dense crystalline aggregate consisting essentially of the following ingredients in proportions by weight within the respective indicated ranges: trisodium phosphate about 1% to 35%, sodium silicate about 1% to 25%, soda ash about 10% to 50%, total water about 30% to 40%, a phosphate of the class consisting of sodium hexametaphosphate and sodium tetrrophosphate about 1% to 15% and an alkali-stable surface active agent up to about 5%, the $\text{Na}_2\text{O}:\text{SiO}_2$ ratio of the silicate being not less than 1:1 nor greater than 2:1.

Abrading Wheel

U. S. Pat. 2,387,298. G. W. Rochwald, Oct. 23, 1945. A wheel of the character described comprising a body including a main section, an expansible rim, a plurality of radially movable thrust members mounted on said main section and connected to said rim, and means for simultaneously actuating all



Cowles



• A new outstanding COWLES CLEANER for non-tarnishing cleaning of polished and unpolished brass, copper and bronze in still tanks with or without electric current—also in all types of washing machine equipment. Cowles K W does not attack the metal. It is fast, efficient and economical. Immediate shipment from warehouse stocks.

THE COWLES DETERGENT CO.
METAL CLEANER DEPT.
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TROXIDE

A Modern Pickling-Agent for MODERN INDUSTRY

TROXIDE . . . the new, revolutionary pickling-agent . . . is the modern way of removing rust and scale from ferrous, non-ferrous and precious metals. A scientifically developed com-

ound of dry, inert chemicals, **TROXIDE** becomes active *only* when dissolved in water . . . thereby permitting *safe* handling and storage. When dissolved in water, **TROXIDE** spreads a blanket of safety, called "**PROTECTOFOAM**," over the pickling solution . . . preventing the escape of acid particles into the air, and returning them to the solution for useful work. "**PROTECTOFOAM**" also helps to control splashing . . . in short, it protects workers and equipment from acid hazards.

TROXIDE is non-inflammable . . . it is non-eruptive. A solution of **TROXIDE** lasts several times longer than the conventional acid-bath . . . and the action of this new pickling-agent slows as good metal is reached, reducing the danger of over-pickling.



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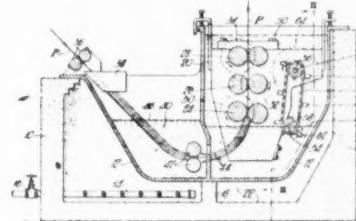
of said thrust members radially to expand and to contract said expandable rim including an actuator section rotatably mounted on said main section coaxially with said rim, an element connecting each of said thrust members to said actuator section and movable relatively to both thereof so that said thrust members will be moved longitudinally inwardly and outwardly upon relative rotation of said actuator and said body in opposite directions respectively, and an operating member for rotating said actuator section including a link pivotally connected at one end to one of said body sections, and a cam rotatably mounted on the other body section and operatively connected to said link so that rotation of said cam will cause relative rotation of said body sections.

Tungsten Solution

U. S. Pat. 2,384,301. C. G. Harford, assignor to Arthur D. Little, Inc., Sept. 4, 1945.
A process of electrolysis that comprises electro-depositing tungsten from an undivided cell containing an aqueous electrolyte consisting essentially of tungsten ions and an alkyl hydrocarbon diamine and manifesting a pH value above 7.0.

Hot Dipping Sheets

U. S. Pat. 2,388,131. F. E. Fairley, L. T. Lindquist, C. D. Michaels and H. C. Rodgers, assignors to Tennessee Coal, Iron and Railroad Co., Oct. 30, 1945. In the pro-



duction of metal coated sheets involving passing each sheet through a bath of molten coating metal and then through a body of oil superposed on said bath, the improved method comprising elevating some of the molten metal above the top level of the bath in a path in spaced relation to the path of movement of the sheet, and emptying the thus elevated metal into the upper portion of the oil body and allowing it to cascade by gravity therethrough so as to maintain the oil at the optimum operating temperature.

Cleaning Composition

U. S. Pat. 2,386,789. G. W. Gregg, assignor to Bendix Aviation Corp., Oct. 16, 1945. In a stratified surface cleaner for cleaning relatively hard materials, the combination of the following stratifying materials: a solvent comprising one of the chlorinated hydrocarbons, a detergent comprising a vegetable oil soap, a penetrant comprising a tar acid oil, a coupling agent comprising normal butyl alcohol, an anti-foaming agent comprising ethyl alcohol, a preservative comprising rosin, a blending and thinning agent comprising sodium bichromate, and water.

LOOK HOW

Bumper-to-Bumper SERVICE

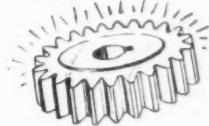
Bumper-to-Bumper DIVERSEY SERVICE FOR SPRAY WASHING MACHINES

Here are a few typical difficulties that Diversey Service can help solve . . .



Free rinsing . . .
no residue on work

Efficient removal of
contamination



No clogging of jets



No sticky deposit
on washer



No foaming of solution



will put your

Spray Washing Machine in tip-top operating condition!

Having trouble with your spray washing machine? Nozzles clogging? Solution foaming and spilling over? Work not coming out clean? Call in a Diversey D-Man for "bumper-to-bumper" service . . . for a complete check-up of your spray washing operations.

With his years of practical experience, the Diversey D-Man has the know-how plus the right "tools" to do his job efficiently. By right "tools" we mean, of course, the right products . . . like Diversey DC-14 which has been specially developed for use in spray washing machines where an alkaline solution is indicated.

Call in a Diversey D-Man today. Even where cleaning operations seem to be going along smoothly, the Diversey D-Man can usually point out ways to get better results at lower operating costs. Just write Metal Industries Dept., The Diversey Corporation, 53 W. Jackson Blvd., Chicago 4, Ill.

AT YOUR SERVICE

DIVERSEY
D-MAN

DIVERSEY DC-14 — For Spray Washing Machines

A white powdered material, instantly and completely soluble in water, DC-14 has been specially developed for use in mechanical washing machines which have difficulty with foaming. An excellent cleaner for iron and steel parts, DC-14 possesses unusual water softening ability, an important factor in keeping nozzles, jets, pipes and pumps free from hard water scale. Keeps machine in A-1 mechanical working condition with no deposits or sludge clinging either to the machine or work.

SHOP PROBLEMS

PLATING AND FINISHING
POLISHING — BUFFING
CLEANING — PICKLING
HOT DIP FINISHES

METAL FINISHING publishes, each month, a portion of the inquiries answered as a service to subscribers. If any reader disagrees with the answers or knows of better or more information on the problem discussed, the information will be gratefully received and the sender's name will be kept confidential, if desired.

Deposition of Silver on Glass

Question: I have been a subscriber to *Metal Finishing* for the past twenty years. I am a plater by trade and am very much interested in silver depositing upon glass. I will appreciate it if you can give me some kind of information about it.

I. S.

Answer: A series of articles covering the subject was written by *Wein* and published in the September 1944-March 1945 issues, inclusive, of *Metal Finishing*. We would suggest that you examine your back copies for this information.

Plating Electric Irons

Question: Some time ago, I saw an article in *Metal Finishing* on the electro-plating and polishing of electric irons. In trying to locate this article, I have gone through all the indices since December 1937, but could find no mention of it.

Apparently, the article must have been published prior to these issues, and inasmuch as we have no indices of earlier copies, we would appreciate it if you could check for us the issue in which this article appeared.

A. T. L.

Answer: Some pertinent data appeared in an article by H. L. Farber, entitled "The Choice of Plated Coatings" on page 154 of the April 1945 issue of *Metal Finishing*.

We believe that additional data will be found in an article by R. M. James, Proc., American Electroplaters' Society, page 281 (1934).

Schools for Electroplating

Question: Would you please be so kind as to recommend to us several schools for study of electroplating in New York area, and any other information that you think might be helpful to us.

P. L. K.

Answer: Courses are offered at the Institute of Electro-chemistry and Metallurgy, 59-61 East Fourth Street, New York, N. Y.

We believe a course is being given at the College of the City of New York and suggest that you contact this Institution.

Plating Solutions

Question: I'm a subscriber to the *Metal Finishing* magazine and your "Shop Problems" section is very helpful to me. Would you please try to help me on one of my problems? It's one that I would like to experiment with but I don't know if it will work—and it may prove useful to me after the war.

I have a few pounds of single nickel salts and some cadmium oxide. I've been told that a bright deposit of nickel can be plated out of a cold nickel solution with cadmium as the brightening agent. Can you give me the formula by which this is done. It's to be only a flash plate, either over highly polished pieces of brass, or sterling silver castings prior to gold plating. I'd like to try out this solution and see how it works—in an eight gallon cistern.

Also, what is the formula for a nickel solution in which gum arabic is used as a brightener. Is this hot or cold? And at what current density and voltage is it used? Can I use this as a flash plating on cast sterling silver pieces prior to gold plating?

In the *Plating and Finishing Guidebook* I noticed your formula for barrel plating for a nickel solution. You don't mention the voltage or amps./sq. ft. as in the others. What current density and voltage is to be used with that formula?

In my gold plating, I cut down my own gold for the yellow gold solution I use. When I got through as usual and made my addition and started to plate I got all my work coming out very dark, almost black looking. What could have happened to cause that?

I'd like to have a pink gold plating solution. What can I add besides copper cyanide to get that kind of a finish? Adding copper gives it a red color but not the shade of light pink that I want.

F. D.

Answer: To use cadmium oxide as a nickel brightener, it should be dissolved in a small amount of hydrochloric acid and added on the basis of 1-2 oz. of cadmium oxide to 100 gallons of solution. Gum arabic should be dissolved in water and added in the amount of about 3-4 oz. per hundred gallons of solution. Standard room tempera-

ture nickel plating solution may be used with this brightener.

A barrel nickel tank should be operated at 8-12 volts.

The brown color of your gold deposit may be due to improper washing of your gold fulminate.

To lighten a pink gold, add nickel cyanide in small amounts. If this is not available nickel sulfate or carbonate may be used.

Copper and Chromium on Steel

Question: There have appeared on the market chromium plated articles in which the chromium is deposited over copper over steel without nickel.

So far tests indicate that chromium plating in thicknesses ranging from .00001" to .00003" has very poor resistance to corrosion when exposed to moist atmospheres. Have there been any new techniques for chrome plating developed so that reasonable corrosion resistance can be obtained without an undercoat of nickel? What thickness of chrome plating is optimum for protection of steel furniture tubing?

L. M. S.

Answer: Fairly good corrosion resistance will be obtained if a minimum thickness of copper deposit of about .001" is used followed by a chromium deposit at least .00001".

We do not consider such a coating satisfactory because of the tendency of the chromium to crack away from the copper base.

Barrel Chromium Plating

Question: We are interested in barrel chromium plating and we should appreciate if you would give us detailed information regarding this type of plating and the equipment necessary.

T. J. H.

Answer: Although plating barrels have been designed and patented for this purpose, we do not know of any commercial use to which they have been put.

Testing Gold

Question: Through your Information Department could you advise me as to what chemical a jeweler uses to test gold? Also what reaction is to be observed in such a test?

H. H. M.

Answer: The usual test for gold is absence of any reaction with concentrated nitric acid. A drop of this acid is applied to the surface and the effect noted. Reaction of the nitric acid with the underlying metal should not be mistaken for reaction with the deposit.

FOR HIGH ALKALINITY pH MEASUREMENT...
FOR HIGH TEMPERATURE pH MEASUREMENT...
FOR YOUR PARTICULAR pH MEASUREMENT...

**Get the instrument
Beckman engineers
have perfected for the job!**

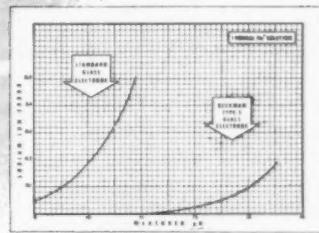
PROPER pH control of processing operations is one of the most important industrial developments in recent years. Step after step in the development of this modern tool has been pioneered by the Beckman research staff—bringing reduced spoilage, improved product quality and lower production costs to thousands of different plants in a wide variety of industries.

Through these years of pioneering, the Beckman organization—world's largest manufacturer of glass electrode pH equipment—has developed advanced types of pH electrodes found nowhere else in the industry... unique electrode assemblies that open up entirely new fields to the greater profits and higher production efficiencies obtainable through accurate pH control.

Among the many pH problems solved by Beckman engineers, the following are typical...

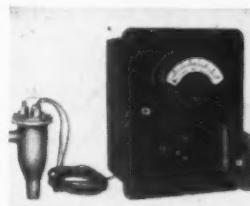
HIGH ALKALINITY Even in highly alkaline sodium solutions—a difficult or impossible application with other glass electrode pH equipment—you can obtain uniform accuracy with Beckman equipment. The Type E Glass Electrode—an exclusive Beckman development—makes measurements up to pH 13.5 with a sodium error of only 0.2 in 1 Normal Sodium solutions. In chart at right, above, compare this accuracy with that of standard glass electrodes. This advanced development is of tremendous value in highly alkaline

plating processes... in soap solutions... in processing detergents, cleaners and many other applications. Investigate what this exclusive Beckman development can mean to your present or future plant processing operations!



HIGH TEMPERATURES If yours is a process involving high temperatures, remember that Beckman—and only Beckman—has perfected a High Temperature Glass Electrode that can be used continuously in boiling hot solutions. This advancement is particularly useful in many food processes... in boiler feed water conditioning... and in a wide range of chemical processing operations.

HARD SERVICE Still another typical Beckman development is the "X9" Electrode—a glass electrode particularly designed for unusually severe operating conditions such as continuous immersion in paper pulps, in ore slurries and other abrasive materials. So sturdy is this electrode that it withstands more than 100 pounds direct force on the immersion end without breaking, and its thick walls withstand an unusual amount of abrasion.



The Beckman Automatic pH Indicator—the most advanced pH instrument available today.



The Beckman Industrial pH Meter—ideal for portable plant and field use.

WHATEVER your pH measurement or control problem, let the Beckman research staff study your particular requirements and recommend the type of pH installation you should have. You will get the most advanced pH equipment available—equipment that will still be modern years from now.

FREE! "What Every Executive Should Know About pH"—a simple non-technical explanation of pH control, what it is, how it's used. Send for your copy today!

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NEW EQUIPMENT AND SUPPLIES

NEW PROCESSES, MATERIALS AND EQUIPMENT FOR THE METAL INDUSTRY

Cleaning Metal Parts

The Equipment Division of the Magnus Chemical Co., Inc., Dept. MF, Garwood, N. J., announces a new small machine for cleaning metal parts in production. It is especially suited for metal working shops whose volume of parts to be cleaned does not warrant the installation of expensive, fully automatic cleaning equipment.

The Magnus Adja-Dip, Jr. Cleaning Machine is used in metal working plants for the complete removal of cutting oil and chips, buffing compounds, smut, abrasives or any other deposits resulting from stamping, drawing, cutting, grinding, burnishing or other operations. Parts are handled in batches of 30 to 75 lbs., depending upon the model of the machine. One full batch of parts can be handled every two or three minutes.

The Magnus Adja-Dip, Jr. cleans by Agitation. The parts to be cleaned are vigorously agitated up and down seventy-two times a minute, in the cleaning solution. This agitation, plus the action of the cleaning solution, "shears" the dirty deposits from all surfaces of the parts.

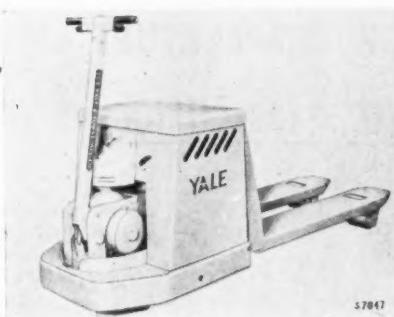
The Magnus Adja-Dip, Jr. can be used with any type cleaning compound, alkaline, petroleum spirits, emulsifying agents and chlorinated solvents. It may be used with hot or cold solutions. If heated, heating may be by either electricity or gas. It is available in two sizes, #20 and #200. Either of the two models can be supplied with built-in rinse compartments which may also have the agitation feature, if desired.

Magnus Bulletin #200-AJ completely describes the Aja-Dip, Jr. Cleaning Machine. For your copy, write to: Equipment Division, Magnus Chemical Co., Inc., Garwood, N. J.

Electric Lift Truck

Newly added to the Yale line of materials handling machinery is the Worksaver Electric Truck. With power for lifting and power for travel, the Worksaver relieves its operator of all physical strain. Compact and easily controlled, it can be maneuvered in congested areas, along narrow passages, and around sharp corners without waste of time or effort.

The Worksaver, it is claimed, actually reduces materials handling to little more than a strolling and steering operation. A man or woman operator can pick up and "walk off" with loads up to 3 tons merely by using finger-tip pressure on dual cam controls located immediately beneath the hand bar-grip. These controls are designed so that when finger pressure is released, they return to neutral—cut off the power. Two forward and two reverse speeds are provided.



Important safety features are found in the mechanism of the Worksaver. When the cam controls on the steering handle are at neutral, the brake is "on." When the steering handle is in vertical or horizontal position, the brake is automatically applied and the power is cut off. This arrangement not only gives the operator complete control of the truck on ramps, but, in the event the handle is dropped by accident, the truck is halted immediately.

The Worksaver is illustrated and described in a new catalog which will be sent on request. Write The Yale & Towne Mfg. Co., Dept. MF, 4530 Tacony St., Philadelphia 24, Pa.

Flexible Ducting

A new material, "Airtron," created during the war for aircraft heating and ventilating, is now available for other manufacturers as a ducting for hot or cold air. Made of glass cloth and rubber, it provides very high insulation qualities as well as great flexibility. The flexibility makes its use very desirable where vibration is present, for it will operate indefinitely under conditions where metal ducting would develop fatigue cracks. Tests indicate that the heating, ventilating and air-conditioning of future planes, trains, automobiles, buses and homes will use a great deal of Airtron.

It withstands temperatures from minus 60 degrees F. to 300 degrees F. without a change in properties and will stand well over 50 pounds per square inch internal



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Rates for regular "Control Service" as low as \$10 monthly. Information and Price List furnished on request.

What new "armor" for steel can save America millions each year?

YEAR AFTER YEAR—in war or peace—America pays a colossal toll in dollars to a foe as unrelenting as any ever known.

It is the enemy *rust*, that attacks and destroys things made of steel. But now a remarkable new discovery can bring you steel products that will *defy* rust up to 4 times longer . . . Hardware, screens, fencing, automobiles, tractors, dozens of important items that will outlast any you've ever owned by as much as 4 to 1!

This remarkable discovery is CORRONIZING, the patented alloy "armor" that gives steel a new lease on life. Yes, CORRONIZING is new . . . but also thoroughly tested and proved. For CORRONIZING has demonstrated its overwhelming superiority in the war, under the worst possible conditions on land, at sea and in the air.

By test and performance, CORRONIZING FAR OUTLASTS OTHER PROTECTIVE COATINGS FOR STEEL. Now, the more progressive factories and retailers will be able to bring you products made of "Corronized" steel. Motor car makers—always leaders—will be among the first to offer you this sensational advantage.

Remember that name—CORRONIZING. It can save you and millions of other Americans a huge tax bill now needlessly paid to the enemy *rust*.

Standard Steel Spring Co.

ORIGINATORS OF

CORRONIZING

*The Magic Carpet to
Longer Life for Steel*



Quick Facts for Manufacturing and Sales Executives

Do not confuse CORRONIZING with other metal coatings. This patented process provides a permanent alloy "armor" with 5 layers of defense against corrosion! It becomes part of the steel base . . . can be worked in any manner. Permits using lighter materials by prolonging steel's period of greatest strength. Write for samples and complete information.

STANDARD STEEL SPRING COMPANY
CORAOPOLIS, PENNSYLVANIA

Hand Truck



HARD CHROMIUM



- To Maintain Accuracy and Increase Tool Life
- To Prevent Corrosion and Reduce Wear
- To Resist Heat and Eliminate Seizing
- To Reclaim Worn and Off-size Parts

Dovetails WITH YOUR PLANS

ELECTRODEPOSITED CHROMIUM offers you a proven means of saving time and materials; of hitting a faster production pace and improving the performance of your products. The chromium plated surface is resistant to wear, abrasion, heat and corrosion, and has a very low coefficient of friction.

Remember, United Chromium has "lived" with chromium plating since its inception. In addition, we have engi-

neered it into the tremendous variety of applications where it has proved successful.

The wealth of knowledge we have acquired is available both to our present licensees and interested manufacturers. Why not draw upon this to determine the suitability of Hard Chromium Plating to your work? The first step is, simply, write to our nearest office outlining your problem.

OTHER U. C. PRODUCTS AND PROCESSES TO SERVE YOU

★ **UNICHROME ALKALINE COPPER** for smooth, lustrous copper plating in a non-cyanide bath.

★ **ANAZINC** salts for anodic treatment of zinc, giving greatly increased corrosion-resistance.

★ **UNICHROME DIP** for increased corrosion resistance of zinc and cadmium — without electric current.

★ Trade Mark U.S.Pat. Off.

★ **UNICHROME STRIP** for speedy removal of copper, chromium, zinc, etc.

★ **UNICHROME RACK COATINGS**

★ **UNICHROME STOP-OFF LACQUERS AND COMPOUNDS**

★ **UNICHROME Clear and Pigmented LACQUERS**

★ **UCILON** corrosion-resistant coatings for protecting surfaces against acids, alkalies, water, gasoline and various corrosive chemicals.

UNITED CHROMIUM INCORPORATED

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New York 17, N. Y.

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Detroit 7, Mich.

pressure at all temperatures. It is unaffected by air, light, water, gasoline, oil and all but concentrated mineral acids. Manufactured in tubes from 1 inch to 6 inches in diameter and in any length desired, as well as in specialized shapes where required for unusual installations, the ducting can be adapted to any equipment as a replacement or as an original installation.

Airtron is made only by Arrowhead Rubber Co. Literature and information concerning the characteristics of Airtron, suitable to the inquirer's needs, will be sent immediately upon application to Dept. A-84 Arrowhead Rubber Co., 2244 E. 37th St., Los Angeles 11, Calif.

• Rotary Pumping Unit

A new rotary pumping unit for handling bunker "C" fuel oil and liquids of similar

characteristics has been put into production by the Blackmer Pump Co., Dept. MF, Grand Rapids, Mich., according to J. B. Thottman, general sales manager of the company.

The pump is bronze-fitted and operates on the "bucket design" (swinging vane) principle. Due to this construction, the pump is self-adjusting for wear, so that there is no loss of capacity during the life of the "buckets." When worn to the critical point the buckets may be replaced by simply removing the head of the pump, pulling out the worn buckets and inserting new ones. No adjustments or "wearing in" are necessary. This replacement restores the pump to normal capacity.

The power unit is a gearhead motor of 50 hp with a speed of 150 rpm at the drive shaft connected to the pump by a flexible coupling. The pump has a capacity of 500 gpm and operates at a pressure of 125 psi.

The industrial hand trucks illustrated are two of the three sizes built by Northrop Gaines, Inc., for peacetime use in baggage and materials-handling. They are cast in aluminum and carry light weight roller-bearing wheels which are also cast of aluminum and equipped with molded rubber tires. Northrop Gaines, a wholly-owned subsidiary of Northrop Aircraft, Inc., is using airplane techniques in building these new hand trucks. They are sturdy enough to carry 5000 pounds in tests, but are light in construction and graceful in appearance.

Further information may be obtained by writing to Northrop Gaines, Inc., Dept. MF, Hawthorne, Calif.

Emulsion Cleaner

Phillips Chemical Co. announces their new emulsion type cleaner, PSC, for use in power spray washers, which cleans ferrous and non-ferrous metals and inhibits them against rust, corrosion and hand soil. It is non-toxic and non-injurious to the skin or open cuts; requires no rinsing and will keep the washing tank clean.

PSC is extremely economical in use and can be diluted with water in proportions of from 1-10 to 1-100, depending upon the type and amount of soil and the length of time rust resistance is desired. It is necessary only to wash the parts and blow them dry with air for complete cleaning and rust inhibition. It removes grease, oil, wax, lapping and drawing compounds of all kinds, red lead and other markings, abrasive dust, chips and filings from the surface as well as from ID and OD recesses.

PSC accomplishes its remarkable cleaning action by means of its penetrating properties and its "blanket overflow" action. This cleaner penetrates to the surface of the metal, breaking soil into tiny particles which rise to the top of the solution in the tank and are held in the PSC "blanket" while heavy solid particles sink to the bottom of the tank. The "blanket" may be periodically overflowed, keeping the bulk of the solution in the tank clean and avoiding the washing of other parts with soiled cleaner. In addition there is less strain on

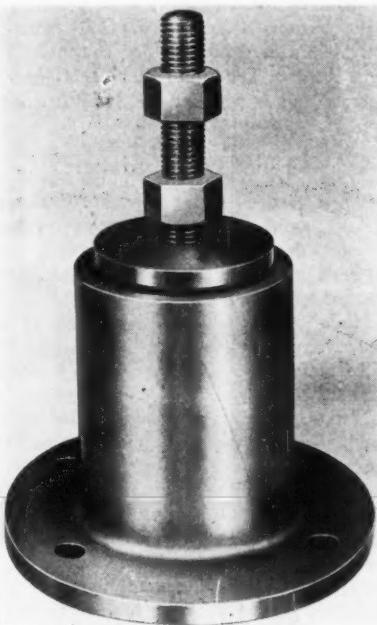
the pumps and much less possibility of clogged spray nozzles.

Depending upon the type of PSC used and the degree of dilution all metal parts are inhibited against rusting, corroding and hand soil long enough for inspection or storage, up to several weeks, yet finish is clean and suitable for painting or other finishing. It is available in three types: #1 for light duty, #2 for heavy duty and #3 for special rust-resistant qualities.

Complete details and prices are available on request to the Phillips Chemical Co., Dept. MF, W. Touhy Ave., Chicago 45, Ill.

Vibro-Levelers

A complete line of low cost rubber insulated dual purpose machinery mountings for stopping vibration from machinery of any size, type, or weight and having a means of leveling the machinery is announced by



Bushings, Inc., Dept. MF, Coolidge Highway at 14 Mile Rd., Royal Oak, Mich.

The new mountings, known as Vibro-Levelers and manufactured in nine sizes ranging in load capacities of from 10 lbs to 2,000 lbs each, are for use on such noise and vibration producing equipment as punch presses, compressors, blowers, forging hammers, grinders, buffers, etc. Designed to be installed quickly with no floor cutting or fitting, they are for use on either new or existing equipment. Brackets, available in various capacities, permit installation of the mountings without materially raising the elevation of the machine.

Being of synthetic rubber, the insulating material employed is not liable to attack by oils or greases and thus can be used under virtually any conditions.

The new mountings are simple in design and construction, are fool-proof and once installed require no oiling, greasing, or other maintenance attention. The synthetic rubber insulating material separates an outer shell, which also forms the base of the mounting,

The Plating Industry's Big 4

MICCROLOID

The most effective Industrial Corrosion-Resistant yet developed. For use on all plating equipment, structural steel, walls, floors, pipe lines, air ducts, etc. Compounded from thermo-plastic resins. Can be brushed, dipped or sprayed. Equally effective on metal, concrete and wood.

MICCROLAC

A mirror-finish, water-white lacquer coating that protects and beautifies the finest of plated and decorative metal finishes . . . Can be sprayed, dipped or brushed . . . Dries very fast—is unequalled for adhesion, extreme flexibility and abrasion resistance.

MICCROTUBE

An extruded plastic base protective tubing—especially suited for use on straight or bent contact wires. Also on selective plating of simple parts. Usually used in conjunction with Miccrotape—fused together to form a perfect leakproof coating.

MICCROTAPE

An extruded tape for masking parts prior to selective plating. Offers unequalled protection for plating racks. Unaffected by boiling cleaning solutions. The tapered edge permits smoother overlapping and fitting into corners.

and **NOW**

COMING!

A new MICCRO protective coating destined to revolutionize the plating industry. Announcement soon! Look for it.

MICCRO
Products

MANUFACTURED AND DEVELOPED BY EXPERIENCED PLATERS

MICHIGAN CHROME and CHEMICAL COMPANY

6340 East Jefferson Avenue

Detroit 7, Michigan

from an inner cylindrical member, to which is fastened a single stud.

Leveling is by means of two nuts supplied with each mounting; one nut is for adjusting the machine to the exact level desired; the other, for locking in the leveled position.

Although available in sets of four, the machinery mountings can be used in any number required for various machines; thus machinery of virtually any size or weight can be insulated and leveled.

When used to support new equipment where the operating height is not important, the mountings are usually placed immediately under the base of machine. Where the machinery is already installed and the height must be maintained at approximately the same level, a series of standard brackets are available so that the mountings can be installed without even cutting the floor.

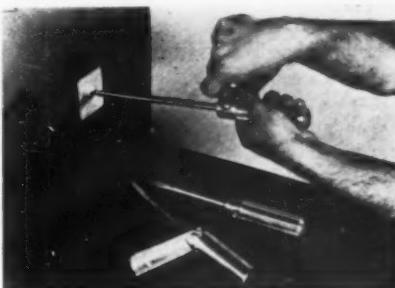
Standard brackets are of two types: Zee and angle. The zee brackets are for attaching to the existing hold-down bolt holes in the base of the machine and require no

cutting or welding to attach to the machine. The angle brackets are for mounting to the side of the machine base with either bolts or by arc welding.

Screw Driver

A handy new tool for mechanics, maintenance men, assembly line workers, engineers, plumbers, carpenters, and others has appeared on the horizon.

It is Tuffy, a new triple-purpose screw



**IT STANDS UP
IN HOT
CLEANERS!**

UNICHROME*

"QUICK DRY"

STOP-OFF 324

This new, fast-drying, stop-off lacquer is especially suitable for highly alkaline cyanide plating solutions operated at high temperatures. It also stands up in hot electrolytic cleaners and acid dips—resists attack during normal vapor degreasing. Adherence is adequate, yet it can be readily peeled off after the cycle is completed.

What's more, Unichrome Stop-Off 324 is easily applied by brush, spray, or dip. It has won high praise in the most efficient production shops. See what it can do for you. A trial shipment will be sent promptly. Write our nearest office for data and prices.

*Trade Mark Reg. U. S. Pat. Off.

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TRY THESE OTHER UNICHROME MATERIALS

Unichrome "Quick Dry" Stop-Off 322—
for high-temperature cyanide copper and
other plating solutions.

Unichrome "Quick Dry" Stop-Off 323—
for chromium plating and other solutions.

Unichrome Air Dry Rack Coating 203

Unichrome Force Dry Rack Coating 202

Unichrome Resist—a solid insulating material for constructing composite racks, etc.

driver tool with a "power-arm" arrangement that gives extra power which unlocks rusted screws an ordinary screw driver cannot budge. In reverse, Tuffy makes possible the last quarter-turn pressure needed to tighten screws and make them stay-put. With the power-arm folded back into the handle, Tuffy becomes a standard type screw driver.

Tuffy's aluminum-power-arm is so constructed that when in use it affords a solid horizontal hand support that allows full hand and body pressure to prevent slipping or gashing of screw head. This tool has an aluminum handle; blade is drop-forged steel and plated to ward off rust. Tuffy is made in 5" by $\frac{1}{4}$ ", 6" x $\frac{5}{16}$ ", 8" by $\frac{3}{8}$ " length blades. Ask your supplier for Tuffy, or write to Swallow Airplane Co., Inc., Dept. MF, Wichita, Kansas.

PROPERTIES

Chemical Resistance—Excellent in all plating cycles.

Application—Can be brushed or dipped—successive coating is minimized.

Drying—Dries quickly at room temperature—adheres without force drying.

Stripping—Removed from work with utmost ease immediately after plating.

Fire Extinguisher

A new carbon dioxide hand fire extinguisher with unique design and quick operating features developed during the war is announced by The B. F. Goodrich Co., Dept. MF, Akron, Ohio.

Made to meet the full approval of fire underwriters, the container holds four pounds of carbon dioxide and comes with a carrying handle and control button designed for fast operation. It can be easily carried in one hand, with the thumb of the carrying hand operating the push button. A horn swivel quickly raises or lowers as needed, remaining in lower position when attached to the wall rack furnished with each extinguisher, together with a quick release chain.

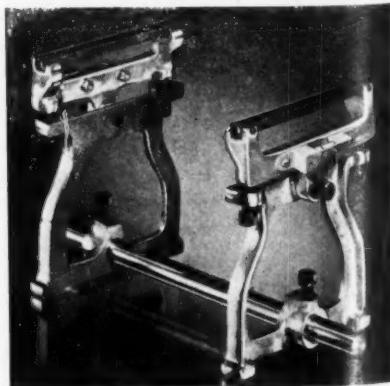
Painted vivid orange and black for high visibility, the extinguisher may be recharged at regular refill service establishments.

Surveys have indicated that the four pound unit, while not meeting all requirements for plants is size used in the vast majority of industrial installations.

Static Balancer

A new precision built static balancer is offered by Samuel S. Gelber, Dept. MF, 34 S. Jefferson St., Chicago 6, Ill.

The new balancer has a number of dis-



Electronic Interval Timer

Electronic Controls, Inc., Dept. MF, 44 Summer Ave., Newark 4, N.J., announces a new electronic timer suitable for all applications requiring highly accurate circuit timing.

Time range is from 1 to 120 seconds in increments of one second. Accuracy better than 5%. Unit is housed in an attractive slope front steel cabinet with handsome crackle finish. Two dials are provided for time selection. One dial is calibrated in single seconds; the other in 10 second steps. Dials control tap switches. Unlike potentiometer control, the snap-positioning step-switches assure precision control, with exact values of resistance inserted in the circuit at each position. A pilot light, toggle on-off switch and a push-switch are included.

A double receptacle permits timing two

distinctive and useful features that make it a useful addition to shops where rotating parts must be put in static balance. The 9" model illustrated has a finger tip span adjustment up to 9½".

The balancer is reasonable in price, unusually compact and readily portable. It is set up easily on any fairly level support. The balancing surfaces have built-in spirit level and fine thread adjustment screws. These permit ready compensation for high or low spots in the bench or supporting surface and the built-in spirit levels make it easy to obtain accurate settings.

The balancing surfaces are deep hardened with accurately ground ways for extreme sensitivity and elimination of friction.

The supporting standards are light weight, yet sturdy and durable.

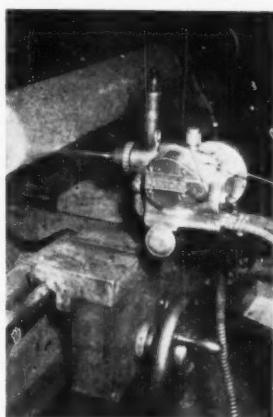
Swing capacity is 9", the supporting capacity is 50 lbs. and shipping weight is 2 lbs.

Two larger models are available in the 24" and 36" size.

Inquiries are solicited from responsible sales representatives.

Metallizing Gun

The new Metco Type Y Metallizing Gun—unlike the hand gun, is designed and built specifically for mechanical mounting and continuous operation. Its many outstanding features include the use of 3/16 inch wire—a revolutionary "first time" which when



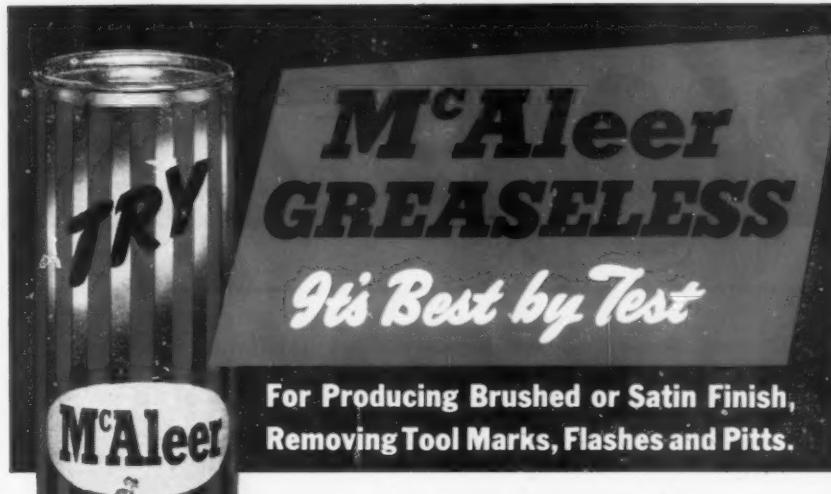
combined with an acetylene pressure of only 15 p.s.i. more than doubles any previous spraying speeds.

The Metco Type Y Gun—because it is designed with a total disregard to weight and size limitations necessary for the hand gun—is much heavier and much more rugged in construction. Gears, worms and bearings, several times larger than any used previously, virtually eliminates wear and replacement. This coupled with lower operating and maintenance costs effects considerable savings.

These and other features are described in great detail in Bulletin 49P which will be mailed on request to Metallizing Engineering Co., Inc., Dept. MF, 38-14 30th St., Long Island City 1, N. Y.

Bulk Tank Preheater

A remarkable New Bulk Tank Preheater has been developed by Rempe Co., 342 N.



McALEER GREASELESS composition can have an important future in your finishing plans. Unsurpassed for producing satin, Butler or Colonial finishes on base metals or plated parts. Prime favorite for removing tool marks, flashes, pits and other surface imperfections. And that's not all—when used on a flexible buff, it completely finishes irregular contours and recesses, quickly, easily, cleanly, free of any grease.

Furnished in standard grain sizes.

HAVE YOU SENT
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WRITE TODAY



McALEER
MANUFACTURING CO.
QUALITY-CONTROLLED
Automotive Household Industrial
FINISHING MATERIALS
ROCHESTER, MICHIGAN
McALEER MANUFACTURING CO., LTD., CHATHAM, ONT.

Sacramento Blvd., Chicago 12, Illinois, for preheating heavy liquids in bulk storage. It embodies features which make it distinct from any equipment heretofore employed.

Many industrial users of fuel oil have found it necessary to buy the heavier lower grade oils, which cannot be used without preheating. Oil flows more freely at higher temperatures and gives more B.T.U.'s.

This Preheater can be made to fit any size tank having a manhole 16½" or larger. It is installed by cutting or drilling holes for pipes in manhole of the tank.

Thirty-eight square feet of direct radiation surface, plus 10 square feet of secondary shell heating surface is provided.

It is provided with a flow accumulator which makes it necessary for liquids to flow over the coils before entering the suction line—preheating is assured.

Built for use with steam or hot water as desired by providing proper size inlet and outlet pipes at time of fabrication.

The coil is 1½" standard steel pipe. Shell is 12 gauge sheet steel—16" O.D. Accumulator is steel construction bolted in place. Complete unit tested with 400 lbs. air pressure under water after fabrication. Pipes made proper length for each installation.

For further details write Rempe Co., Dept. MF, 342 N. Sacramento Blvd., Chicago 12, Ill.



You'll never know
how TOUGH - - -
yet FLEXIBLE - - -
Plating Rack In-
sulation can be
until you've tried
BUNATOL 160 or 720

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New Books

Collected papers on Metallurgical Analysis by the Spectrograph. Edited by D. M. Smith. Published by the B.N.F.M.R.A., Euston Street, London, N. W. 1. 1945. 162 pp. 58 figs. Price: 21s.

For some years past the B.N.F.M.R.A. Sub-Committee on Metallurgical Applications of the Spectrograph has operated through various panels covering different aspects of the work. Apart from guiding the Association's own spectrographic researches the in-

dividual members of the panels have also provided results obtained in their own laboratories. In this way a considerable number of reports have been distributed to the B.N.F.M.R.A. membership, some emanating from the Association's own research staff and some from laboratories of member companies.

The present volume contains a selection of thirteen papers based on these various reports: two on the processing and calibration of the photographic plate; four on analysis of aluminum and aluminum alloys; three on lead and lead alloys; one on zinc alloys; two on copper alloys; and one on platinum. The co-operative nature of this work is

shown by the fact that of these thirteen papers, six are from members of the Association's staff, three from member companies, one from a Government Department and three are reports from panels of the B.N.F.M.R.A. Sub-Committee.

The book is not a systematic treatise on the spectrographic analysis of metals and alloys, but many of the papers make practical recommendations on various aspects of technique. The papers cover a wide range and the book will be of great interest to all engaged in the spectrographic analysis of non-ferrous metals.

The 1946 edition of the *Directory Of New England Manufacturers*, published by George D. Hall Co., 30 Kilby St., Boston 9, Mass., contains information of importance on New England industry. It is divided into four sections: (1) alphabetical listing of all New England manufacturers and the executive personnel of each firm, products made, number of employees, capital investment and branch offices or plants; (2) geographically subdivided listing of the information in (1); (3) a product section classifying thousands of products made by these manufacturers; and (4) a classification of brand or trade names of all products included in the directory. The price of this directory is \$25.00.

Associations and Societies

American Electroplaters' Society Newark Branch

The Newark Branch of the A.E.S. wishes to extend a cordial invitation to all its members and friends to a Victory Christmas party which will be held on Dec. 15th, 1945 at the Robert Treat Hotel in Newark, N. J. at 7:30 P. M.

Staged in the customary Newark Branch fashion, this affair will undoubtedly be another enjoyable and happy evening which will long be remembered.

A delicious and tasty buffet luncheon will be served. This will be followed by a high class show. Good dance music will entertain you for the remainder of the evening.

The cost of admission is \$1.50 per person for branch members and \$2.50 per person for non members. Beer is included in the admission price.

The Newark Branch urges you to be with them on Dec. 15th to spend an evening in a congenial atmosphere among old friends and new.

William F. Bruhs

Los Angeles Branch

Indications are that the *Los Angeles Board of Education* will establish night-school classes in chemistry for electroplaters shortly after the first of the year as a result of efforts to that end made by *Los Angeles Branch* of the A.E.S., Marcus Rynko of re-

ported at the November 12 branch meeting in the Cabrillo Hotel. At the previous meeting Mr. Rynkofs had been appointed a committee of one to contact the school board on the possibility of early reestablishment of the prewar chemistry courses.

He reported that the night principal of Polytechnic High School advised him that parallel courses in elementary and advanced chemistry can be started January 8. Classes (if enrollment minimums are assured) would be held on Tuesday and Thursday nights from 6:30 to 9:30 o'clock. The course would run from January into June.

Definite establishment of the classes on the above date could not be reported, Mr. Rynkofs explained, because the Board of Education requires assurance of a minimum enrollment of 35-15 in the advanced class and 20 in the elementary class. These need, however, not all come from the A.E.S., Mr. Rynkofs declared as the classes will be open to the public.

The proposal is to hold two classes nightly twice a week. The one class would deal with elementary chemistry suited to the needs of those who have had no chemistry instruction. The second class would be designed for those who are already grounded in chemistry but wish to take up chemistry as it applies directly to the field of metal deposition. Members of the one class would graduate to the advanced group as they qualify. It was also reported that the school would make laboratory equipment available for test work by members of the advanced class.

The school board, Mr. Rynkofs reported,

expressed its willingness to select instructors capable of teaching vitalized and visual chemistry, using advanced text books which, through visual presentations of pictures and diagrams, show the components and constituents of chemicals, and how they react on one another.

The only expense to students would be an outlay of \$1.00 for a text book and a deposit of \$1.00 for those doing laboratory tests as part of their advanced class instruction.

If they do not break anything, they get their dollar back. An extra charge will be made for chemicals used in any special tests or analyses a student may wish to make.

Seventeen members present at the November meeting indicated their intention of enrolling and confidence was expressed that the required 35 would be obtained before the first of the year.

Secretary Frank Bunker read a letter from Maurice R. Caldwell, chairman of the sub-

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2. Complete Corrosion Protection.
3. Any Color—Soft or Lustrous.
4. Resistant to Abrasion.
5. No Royalties to Pay.

*Send samples for ALUMADIZING without obligation.
Consult us on your metal finishing problems.*

ALL-BRITE CHEMICAL CO.
WATERBURY 89, CONN.

To polish to a high lustre your post war production, check the improved Lupomatic DEBURRMASTER equipment and compounds.

FOR POST WAR PLANNING

In the right direction use DEBURRMASTER

CUT COST OF DEBURRING,
CUTTING DOWN AND POLISHING
METAL PARTS OF ALL DESCRIPTION

LUPOMATIC TUMBLING MACHINE COMPANY Inc.
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DEBURRMASTER
ACCURATE TO MICROMETER DIMENSIONS
TRADE MARK REG.

For GREATER SPEED and ECONOMY in Masking of Parts and Rack Insulating . . .



Pen-Tube is made of Pen-Tape material but is tubular in form to permit extra-fast insulation of plating rack contact wires. Slips readily into place. Sizes, $1/16$ " to 1 " I.D.; other sizes on application.

PEN-TAPE AND PEN-TUBE can be quickly applied and used at once on rush jobs. For permanent rack insulation, they are fused into a smooth integral covering in 20 min. at 260° F. Repairs become an integral part of the covering.

Wherever solid-type insulation is preferred, you'll find Pen-Tape and Pen-Tube unequaled in durability, economy and ease of application—and where lacquer-type insulation is called for; Pen-Kote Masking Lacquers and Pen-Kote Rack Coatings offer the very same advantages. May we send you descriptive bulletins?



PENINSULAR CHEMICAL PRODUCTS CO.
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VAN DYKE • MICHIGAN

committee on finance of the Supreme Society's research committee, in which Los Angeles Branch was advised that it was expected to obtain 15 sustaining members. Branch President Edgar W. Wells named E. L. Lamoureux as chairman of a committee to contact prospective sustaining members. He will be assisted by John F. Beall of the Harshaw Chemical Co., D. N. Eldred of the DuPont Co., and Howard Woodward of the Sundmark Supply Co.

On the matter of the proposed Newark amendment to the constitution, Los Angeles Branch voted "no," and the secretary was instructed to so advise the national office. It was voted to hold the 1946 educational session in the Los Angeles Breakfast Club, on which the branch has an option for the fourth Saturday in March. Selection of a general chairman of arrangements was deferred until the December meeting.

Ten new members, 5 active and 5 associate, were initiated at the November meeting and applications for membership from three

others were received. Initiated were the following active members:

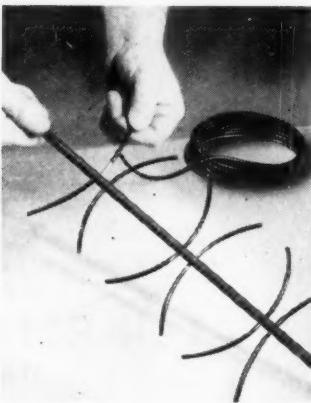
John C. Mayer, Los Angeles Plating Co.; Roswell L. Koch, Cannon Electrical and Mfg. Co.; Paul O. Franke, Price-Pfister Co.; John M. Bowman, Paramount Film Studio; Joseph LaVoie, C-W Manufacturing Co.

Associate members initiated: Joseph D. Taylor, L. W. Leffert Co.; Andrew J. Ospring, L. H. Butcher Co.; Loeb Hinderer, Price-Pfister Co.; James O. Powell, Cannon Electrical and Mfg. Co.; and Ray M. Groom, representing self.

Applications for associate membership were received from LeRoy Christensen of the Christensen Plating Co., and Walter H. Kaelin, Rheem Research Products; and for active membership, from Adolph R. Jahnke, Cadmium and Nickel Plating Co.

The speaker of the evening was Hal P. Curtis of Los Angeles, Pacific Coast manager of the Rustless Iron and Steel Corp. of Baltimore, who presented a talk on electrolytic polishing.

Pen-Tape is the most elastic and flexible material of its kind; unusually easy to apply; conforms to irregular contours and wraps snugly around shoulders. Extends to more than twice its original length, giving exceptional coverage with perfect insulation. Perfectly smooth for leakproof overlap. Resists ALL plating and cleaning solutions, and withstands rough handling. Non-sticky, non-tarnishing, and quickly removed. Available in any width desired; $3/4$ " width is standard.



CALENDAR AMERICAN ELECTROPLATERS' SOCIETY

DETROIT BRANCH

Annual Educational Session and Dinner Dance December 8, 1945

Hotel Statler Detroit, Mich.

NEWARK BRANCH

Victory Christmas Party December 15, 1945

Robert Treat Hotel Newark, N. J.

CHICAGO BRANCH

Annual Educational Session and Dinner Dance January 19, 1946

Palmer House Chicago, Ill.

NEW YORK BRANCH

Annual Educational Session and Dinner Dance February 23, 1946

Hotel Pennsylvania New York, N.Y.

Detroit Branch

At the meeting of November 2, 1945, 110 members were present including 28 new members.

Kenneth Wall of Ford Motor Co., the program chairman, presented Myron Duggin of Hanson-Van Winkle-Manning, who talked on the purification of plating solutions. Mr. Duggin will publish the subject in a later issue of the "Review".

Personals

John S. Hart has resigned from the engineering division of the Chrysler Corp., and is now located in Jackson, Mich., at the Miller-McCluskey Plating Corp.

Dr. J. H. Monowec has been transferred to the engineering laboratories of the Chrysler Corp., Detroit. Dr. Monowec formerly supervised finishing and chemical engineering operations in the Dodge Plant in Chicago.

Bill Newberg, chief engineer of Chicago Dodge transferred to the works administration staff of Chrysler in Detroit.

King Clifford, who had charge of plating at Chicago Dodge, is now plant manager of the Knight Plating Co., in Detroit.

Future Programs

The coming talks in Detroit, which will be on the first Friday of each month follow: January meeting—Mr. Jackson of the Udylite Corp.

February—Dr. Stoddard of Champion Paper & Fibre Co. of Hamilton, Ohio.

March—Inspirational meeting, speaker to be announced later.

April—Dr. Dupbernell, of United Chromium Corp.

May—DuPont representative.

June—Paul Hine of Harshaw Chemical Co.

American Society for Testing Materials

The Executive Committee of the *American Society for Testing Materials* has confirmed an earlier decision to hold the Forty-ninth Annual Meeting of the Society in Buffalo from June 24 to 28, 1946, and in conjunction therewith to have the Seventh Exhibit of Testing Apparatus and Related Equipment.

The 1946 Spring Meeting of the Society will be held in Pittsburgh during the week of February 25 to March 1. This week will also be A.S.T.M. Committee Week during which there will be many meetings of A.S.T.M. technical committees.

Further announcements will be made concerning the technical features of both the Annual and Spring Meetings. Several extensive symposiums are being developed and there will be a large number of technical papers and committee reports.

Porcelain Enamel Institute

At the annual meeting recently held in Pittsburgh, *Richard H. Turk*, Executive Vice President of *Pemco Corporation* of Baltimore, was re-elected President of the *Porcelain Enamel Institute* of Washington.

Three Vice Presidents were also elected—*H. R. Spencer* of the Erie Enameling Co. of Erie, Pa.; *W. A. Barrows* of the *W. A. Barrows Porcelain Enamel Co.* of Cincinnati, Ohio; and *J. T. Penton* of the *California Metal Enameling Co.* of Los Angeles, Calif.

A very ambitious promotional program was outlined by President Turk and the work of the various committees highly praised. Conservative estimates of the use of porcelain enamel indicate a potential market for 1946 as approximately forty per cent above 1941. It is further anticipated that the following three years will show a marked increase above this figure because of the constantly expanding use of porcelain enamel on products that did not previously carry this finish. The fact that a number of colleges have added courses in Ceramics to their curricula indicates the spreading interest and acceptance of this glass-fused-on-metal finish.

Society of Chemical Industry

The *Chemical Industry Medal*, awarded by the American Section of the *Society of Chemical Industry* for conspicuous service to applied chemistry, was presented to *Sidney D. Kirkpatrick*, editor of *Chemical & Metallurgical Engineering*, on Friday November 9, at an 8:15 P. M. meeting in the Hotel Commodore.

At this combined session of the American Chemical Society and the *American Institute of Chemical Engineers*, *Francis J. Curtis*, chairman, and vice-president of *Monsanto Chemical Co.* of St. Louis, presided. *Dr. Howard C. Parmelee*, editor-emeritus of *Engineering and Mining Journal*, discussed the personal side of the medalist; *Albert E. Marshall*, president, *Rumford Chemical Works*, Rumford, R. I., the professional side; and *Dr. Norman A. Shepard*, past chairman,

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For these reasons alone, Pen-Kote 500 merits your consideration for all applications requiring durable protection against corrosion and rot. This paint has other advantages too: It's truly odorless. It's free-working even on hot surfaces; forms a perfect coating without blistering or hardening on the brush. It can be recoated as often as desired without blistering. And it's a perfect sealer; asphalt, pitch, and other paints will not bleed through Pen-Kote 500. Furnished in black, white, gray and standard identification colors.

For perfect protection at minimum cost, more quickly and easily applied—specify Pen-Kote 500. Full information on request.

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and technical director of the *American Cyanamid Co.*, made the presentation. Mr. Kirkpatrick's address was on "Science versus Politics."

The meeting was preceded by dinner at 7.

American Society for Metals

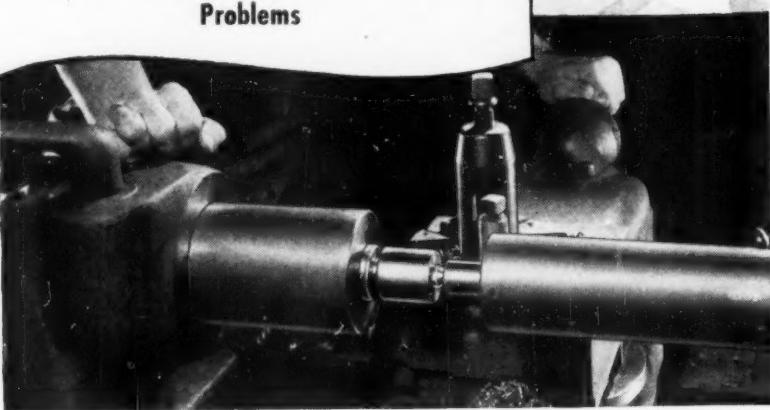
John M. Parks has joined the staff of the *American Society for Metals* as editor of technical books, according to announcement by *W. H. Eisenman*, secretary of the Society. Dr. Parks will also assist in the work of the Educational Committee and prepare lecture series for use by the 69 local chapter groups of the Society.

"Dr. Parks' background in teaching, research and consultation ideally fit him for this editorial work" Mr. Eisenman pointed out. "With many new metallurgical engineering developments coming out of the war, the Society's objective will be to coordinate



Dr. John M. Parks

Ingenious New Technical Methods To Help You with Your Reconversion Problems



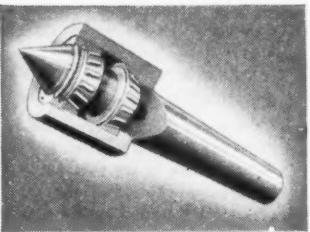
New Precision Built Roto Center Eliminates Chatter...Speeds Production!

Now You Can replace dead centers on lathe and grinder tailstocks, with this new Keene live Roto Center—to increase production—to eliminate all radial play and possibility of chatter! Low in cost, the Roto Center is a high capacity unit, featuring many innovations to speed and improve quality of work!

Matched roller bearings preloaded, are packed with high grade anti-friction grease at assembly. No attention is required for long periods. After assembly, runout is kept to absolute minimum—guaranteed less than .0002. Rear of center is tapped to receive standard hydraulic fitting. Chips, dust and cutting oil cannot reach bearings!

More and more peacetime "helps on the job" are returning to industry. One of these days, famous, flavorful Wrigley's Spearmint Gum will also be back to help you "on the job"—but only when we can assure Wrigley's Spearmint manufacture in quantity and quality for all. Today, we ask you to remember the famous Wrigley's Spearmint wrapper. Tomorrow, you may again enjoy Wrigley's Spearmint Gum quality and flavor while you are at work.

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the advances of the industry and present these in technical books prepared under the direction of Dr. Parks. The score or more of books now being published will also be revised and brought up-to-date under Dr. Parks' direction."

Dr. Parks received his Bachelor of Science degree in Chemical Engineering from Purdue University and his M.S. in Metallurgical Engineering and Ph. D. from Rensselaer Polytechnic Institute. Since 1939, he has been engaged in teaching and research at Rensselaer and had a varied part in the war research program of the Metallurgy Department.

His studies in this activity included the

seam welding of steel to aluminum, spot welding of hardenable steels, and the melting, rolling and heat treatment of experimental magnesium alloys. He has also served as a consultant for various industries concerned with metal spraying, electroplating, steel heat treatment, steel inclusions, welding failures, and X-ray diffraction and radiographic examination.

Dr. Charles H. Herty Jr., of Bethlehem, Pa., was elected national president of the American Society for Metals at the annual meeting held November 2, at the Cleveland Club.

As president of the Society during the past year, Dr. Kent R. Van Horn, assistant man-

ager, Cleveland Research Division, Aluminum Company of America, Cleveland, presided during the annual meeting which was held in conjunction with the regular meeting of the Cleveland Chapter of the Society.

Other officers elected were A. L. Boegel, head of the metallurgy department, Research Laboratories Division, General Motors Corporation, Detroit, vice-president; Dr. H. K. Work, manager of research and development, Jones & Laughlin Steel Corp., Pittsburgh, treasurer; John Chipman, professor of metallurgy, Massachusetts Institute of Technology, Cambridge, Mass., and W. E. Jominy, chief metallurgist, Dodge Chicago Plant, Chrysler Corp., Chicago, trustees.

In addition to election of officers, the annual meeting included a report by W. H. Eisenman national secretary of the Society. Following the annual meeting Dr. Herty discussed "Steel Making Practice as it Affects Properties of Interest to the User."

Dr. Herty was born in Athens, Ga., October 6, 1896, and after preparatory schooling at Asheville, attended the University of North Carolina where he graduated in 1918 with a B.S. degree in Chemical Engineering.

During 1918 and 1919 he was engaged in the Chemical Warfare Service of the U. S. and in 1924 received the degree, Doctor of Science, from Massachusetts Institute of Technology. After serving as physical chemist with the U. S. Bureau of Mines, Pittsburgh, from 1926 to 1931, Dr. Herty became director of research, Metallurgical Advisory Board, Pittsburgh. Joining the Bethlehem Steel Company in 1934, as research engineer, Dr. Herty was appointed assistant to vice-president in 1942. The recipient of the Albert Sauveur Achievement Award in 1943, Dr. Herty is the author of numerous articles on the melting and refining of steel.

Also attending the annual meeting were H. D. McKinney, of Harrison, N. J., past treasurer; Dr. M. A. Grossmann of Pittsburgh; L. S. Bergen, of Pleasantville, N. Y.; R. W. Schlumpf, of Houston; and A. E. Focke, of Indianapolis, trustees.

Eastern Enamelters Club

It has been announced that the next meeting of the Eastern Enamelters Club will be held at the Ritz Carlton Hotel in Philadelphia on December 15.

Two men well qualified by experience to discuss the problems and progress of porcelain enamel will be the principal speakers. Mr. Harry Parker, Enameling Superintendent of the Glenwood Range Co. has chosen as his subject, "Automatic Enameling" and Mr. Carl G. Strandlund, Vice President of the Chicago Vitreous Enamel Product Co. will speak on "The Engineer's Viewpoint on Porcelain Enamel and Its Architectural Possibilities."

Each of these men is a fluent speaker and this meeting promises as fine a showing in enthusiasm and attendance as was exhibited at the last meeting—and this was generally acknowledged to have been tops. The meeting will go in session immediately following a luncheon scheduled to start sharply at 1:00 P. M.

News from California
By FRED A. HERR

Peabody-Acker, Inc., 5816 Hooper St., Los Angeles, manufacturers of hardware, have underway a \$50,000 plating room expansion program involving an expenditure of \$25,000 for an addition to the existing plating building and \$25,000 for new metal finishing equipment.

A two-story 50x50 foot building now under construction will house the plating shop, shipping and receiving departments on the lower floor and offices on the upper floor.

Among the new equipment to be installed is the following:

An 800-gallon high-speed bright copper solution; an 800-gallon chromium solution; a 500-gallon brass and a 500-gallon bronze; two 1500 ampere generators; new polishing equipment, including a variable speed lathe with double motors, and two single-motor units.

The Silver Paint & Varnish Co., 3209 Union Pacific Ave., Los Angeles, is erecting one story brick factory building, 40x60 feet in area, costing \$15,000.

R. W. Armour, formerly production development engineer for the Trophy Products & Manufacturing Co., Chicago, and John Haslett, California sales engineer for the company, have organized the Chemical Process and Engineering Co., with plant, laboratory and offices at 912 East Third St., Los Angeles.

Manufacturing activity of the new firm will deal principally with industrial cleaning compounds, metal processing chemicals and chemical processes for general industrial purposes, Mr. Armour reported. While the greater portion of the initial production is going to the porcelain enamel industry, the firm expects soon to get into production of metal processing chemicals for the plating industry.

Carroll McLaren, who for reasons of health resigned early this past summer as plating room superintendent for the Cannon Electrical and Mfg. Co. of Los Angeles, and spent the summer and fall as manager of the Stony Bridge Ranch near Corona, Calif., assumed the post of plating superintendent for the Chief Products Co., 701 East 59th St., Los Angeles, effective November 8. The company manufactures kitchen ware.

Roscoe Koch, formerly assistant to McLaren with the Cannon Co., now is general foreman of plating for that firm.

Mrs. Harry Pierce, wife of A.E.S. member Harry Pierce of the Spartan Engineering Co. of Los Angeles, died early in November.

D. L. Holbrook, formerly manager, Aircraft Division, Fafnir Bearing Co., New Britain Conn., has been named west coast manager for the company, with supervision over branches in Los Angeles, San Francisco, Portland and Seattle. His headquarters are in Los Angeles.



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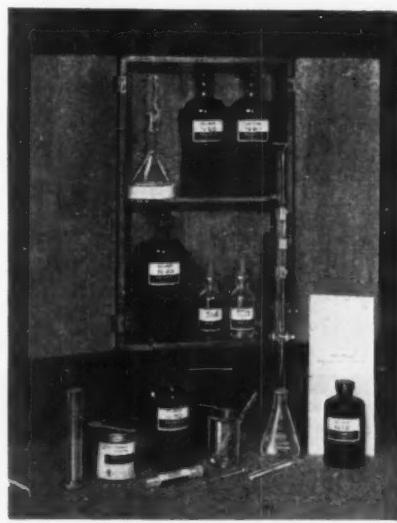
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Manufacturers' Literature



Polishing, Buffing and Deburring

The Industrial Finishing Division of the McAfee Manufacturing Co., Rochester, Mich., has just issued a new, illustrated, 24-page industrial finishing reference manual on "Polishing, Buffing and Deburring."

Among the finishing materials listed in this catalog are those old "stand-bys" of pre-war days which have been retained because of proven usefulness and new finishing compositions developed for post-war production finishing needs.

For the man who uses or specifies industrial finishing materials, this booklet tells when and where to use what compositions, summarizes and interprets applications—offers helpful suggestions for present-day finishing of all types of metals, non-metals and plastics.

The McAfee Catalog is free and available to all qualified industrial finishing material users. To secure a copy, write Industrial Finishing Division, Dept. P-1, McAfee Manufacturing Co., Rochester, Mich.

Thermocouple Data

Wheelco Instruments Co., Dept. MF, Chicago 7, Ill., has issued a new edition of its *Thermocouple Data Book and Catalog*. Containing 32 pages and designated Bulletin S2-6, it gives information on selection of proper thermocouples and carries installation aids. It describes and lists prices and recommendations on thermocouples, thermocouple wire, lead wire, heads, connectors, plug and socket assemblies, insulators, and protecting tubes.

Wood Tanks

One of the most comprehensive, informative booklets on Cylindrical Wood Tanks has been published by Acme Tank Mfg. Co. at Los Angeles.

This booklet is designed to give complete engineering data to the manufacturer, purchasing agent, and engineer who wants to know how wood tanks solve his storage or processing problems. It includes a large amount of engineering facts and forms a hand book for those interested in this im-

ant phase of manufacture: Specifications of Cylindrical Tanks; Tank Foundations; Directions for Erecting Wood Tanks; U. S. Gallons in Round Tanks; Number of U. S. Gallons in Rectangular Tanks; Concrete Mixable; Stave and Bottom Table; Foundation Plan; Concrete Wall Foundations for Standard Water Tanks; Wood Tank Fittings; Special and Standard Red Wood Tanks. A copy of "Cylindrical Wood Tanks" may be had by writing on your stationery to Mr. Sid Levine, Acme Tank Mfg. Co., Dept. F, 5402 South Soto St., Los Angeles 11, Calif.

Business Items

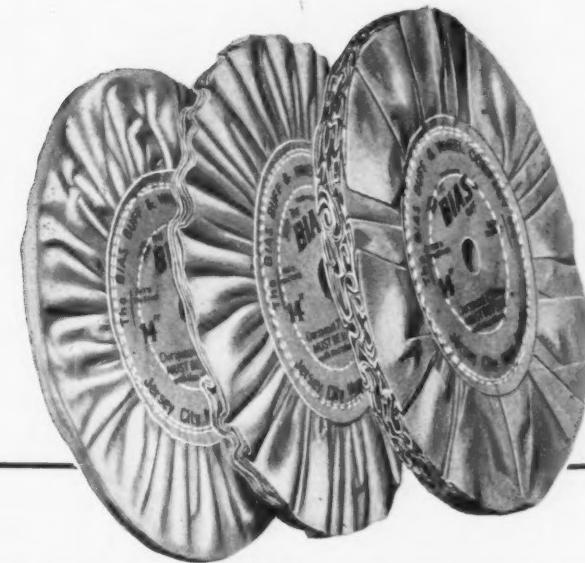
E. T. Asplundh, vice president in charge of the Columbia Chemical Division of the Pittsburgh Plate Glass Co. announces the appointment of Harry W. Gleichert as director of sales for the Division. Mr. Gleichert has long been associated with the Columbia Chemical Division starting with the Company in 1920 and being employed successively in the laboratory, development department, plant operation, technical service, and manager of special products of the sales department. In 1937 he was made assistant director of sales. Mr. Gleichert will be located at the executive sales office in Pittsburgh, Pennsylvania.

In addition, John C. Leppart has been appointed assistant to the operating vice president of the Southern Alkali Corp., Corpus Christi, Texas, and will make his headquarters in Corpus Christi. Southern Alkali is owned jointly by Pittsburgh Plate Glass Company and American Cyanamid and Chemical Corporation. Mr. Leppart was associated with the Columbia Chemical Division of Pittsburgh Plate Glass Company as assistant director of sales from 1931 until January 1, 1942, when he was loaned to the War Production Board in Washington, D. C., as deputy chief of the inorganics branch of the Chemicals Bureau throughout the war.

Robert M. Hatfield has resigned as Deputy Vice Chairman of the War Production Board to become Assistant General Sales Manager of Combustion Engineering Co.

A mechanical engineering graduate of Purdue University, Class of 1932, Mr. Hatfield came with Combustion Engineering Co. in 1934 as a student engineer, subsequently serving in the Service and Erection Department, the Proposition Department and then as sales engineer in the Cleveland Office. In 1942 he went to Washington as chief of the Boiler Section of the Power Branch, WPB under J. E. Krug and later became Director of the Production Scheduling Division.

He resigned from WPB in May 1944 to accept a commission in the Navy, and in November of that year was assigned back to WPB to take charge of the Navy repair parts program. Last April he was placed in inactive status by the Navy to become Deputy Vice Chairman for Production of



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Here in our well equipped modern plant we shall continue to give our customers the same expert care and attention in supplying them with the well known BIAS Buff and Wheels as heretofore.

However, during the reconversion period the shortage of material and labor is a definite handicap to our usual prompt handling of orders. This condition we hope will soon end, and our regular production schedules will then be maintained to meet every customer's buff requirements.

**BIAS BUFF & WHEEL CO.
DIVISION RIEGEL TEXTILE CORP.**

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WPB which position he held until the War Production Board was abolished on November 2, 1945.

Mr. Hatfield is a member of the ASME and a registered Professional Engineer of the State of Ohio.

The Bias Buff and Wheel Co., formerly on Communipaw Ave., Jersey City, N. J., now located at 3464-66 Hudson Blvd., Jersey City, N. J.

The outlook for American business south of the border is brighter than it has been for some years and the general attitude toward American products seems friendlier according to M. L. Langel, head of the export department of the Brush Division of The



M. L. Langel

Osborn Mfg. Co., Cleveland, Ohio.

Mr. Langel, who also is district manager of the company's New York office, recently returned from an extensive trip to the various business and industrial sections of Mexico. He investigated particularly the possibilities for power brushing uses in connection with Mexican manufacturing processes.

The Pemco Corporation has announced the addition of R. Wayne Gates to their research and development staff. Mr. Gates graduated in 1940 from the University of Illinois with a MS in Ceramics. He entered the army in 1940 and was honorably discharged with a 2nd Lieutenant's rating.

His coming to Pemco is in line with the company's determination to expand its facilities in accordance with plans set up previous to the end of the war.

Pemco officials also announced John Steencken is now a part of their service organization and that William (Bill) Cooper of their laboratory staff is now at the University of Ohio doing research work for the United States Government.



COMPOUNDS: Burring, Cutting Down, Polishing, Mirror Finishing.
4A CEMENT: Used for setting up Wheels, Belts, Buffs & etc.

HARRISON & COMPANY, INC., HAVERHILL, MASSACHUSETTS



Harry L. Smith

Harry L. Smith, National Director of *Elite Products, Inc.*, Los Angeles firm manufacturing industrial cleaning compounds, returned recently from a six weeks' reconnaissance trip through the country. The purpose of this 7,200 mile trip was to check on post-war factors important to the cleaning compound industry.

Headquarters of the Export Department of the *Reynolds Metals Co.* have been moved from Richmond, Virginia to the Reynolds Metals Building, 19 East 47th St., New York City, effective November 11. The move was announced by *J. Louis Reynolds*, vice president.

Chester A. Snell has joined the staff of *Oster D. Snell, Inc.*, consulting chemists and engineers, 305 Washington Street, Brooklyn 1, New York. Dr. Snell is an alumnus of Polytechnic Institute of Brooklyn where he received his B.S., M.S., and Ph.D. degrees in chemistry. He is a member of Sigma Xi, Phi Lambda Upsilon, A.A.A.S.,



Chester A. Snell

A.C.S., A.I.C., and A.I.Ch.E. For the past three years, Dr. Snell has been connected with the Chemical Development Division,

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UNICHROME* COATING 202

Protects them from Punishing Plating Cycles

Compounded of new and improved resins, Unichrome Coating 202 has exceptional chemical resistance, unusual toughness and superior adhesion. Even with high-temperature plating solutions, corrosive anodizing baths and severe cleaning cycles, your racks will enjoy a longer, more useful life when insulated with this coating. This means important hours saved and money in your pocket.

Check (right) the properties of Unichrome Coating 202. Order a trial shipment now and put your racks in shape to do a better, longer job for you. Our nearest office will gladly supply information and prices.

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Chemical Resistance—Excellent for all plating cycles.

Toughness—Withstands repeated flexing and shop handling—cuts cleanly and easily at contacts.

Drying—Dipped at room temperature in container in which it is shipped—force dried at 200°F. for extra protection.

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TRY THESE OTHER UNICHROME MATERIALS

Unichrome Air-Dry Rack Coating 203—can be dipped or dried at room temperature, for use in all plating solutions.

Unichrome Quick Dry Stop-Off 322—for cyanide copper and other plating work requiring extreme adhesion.

Unichrome Quick Dry Stop-Off 323—for chrome and other work requiring a stop-off that can be peeled off.

Unichrome Quick Dry Stop-Off 324—for high temperature solutions. It also resists vapor degreasers for a limited time.

Aluminum Company of America, East St. Louis, Ill.

The *Penetone Co.* of Tenafly, N.J., manufacturers of non-inflammable, non-toxic degreasers for over ten years, have announced their peace-time program which got under way recently with the addition of a second story to their plant at Tenafly and the purchase of a site adjoining their present one and including a railroad siding.

The Industrial Division will continue to sell to factories and institutions the line of degreasers and cleaners, headed by the liquid concentrate, Penetone, with which they have long been familiar.

In addition to the expansion of their present building, construction has already been begun on their new property, of a second building to be an exact duplicate of the existing one, and which will afford additional facilities for production and storage.

Warner R. Over has been named Treasurer of the *Pennsylvania Salt Mfg. Co.* following the retirement of *L. A. Smith* who served as vice president and treasurer.

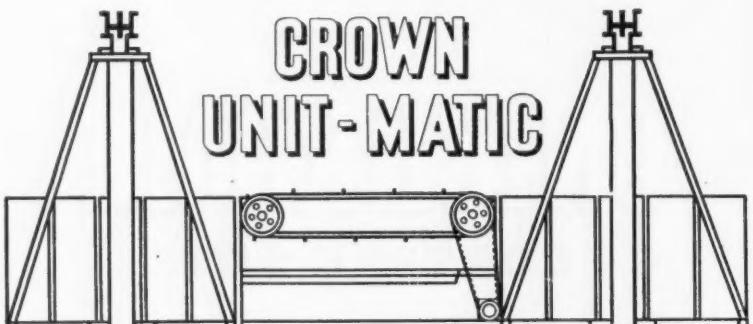
Mr. Over, who joined Pennsylvania Salt as a clerk in 1904, was appointed secretary of the company in 1940 combining this with the title of assistant treasurer. He will now act as secretary-treasurer. Mr. Over is a native of Philadelphia.

Clarence H. Sample, formerly a member of the technical staff of the *Bell Telephone Laboratories*, has joined *Rheem Research Products, Inc.*, Baltimore, as Chief Engineer.

In this capacity, Mr. Sample's chief task will be to coordinate technical matters among the research laboratory, pilot plant, field tests, and commercial applications for

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Phosphor Bronze, Bronze Gilding Metal
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Waterbury, Conn.



C. H. Sample

the company's product, Iridite. He will work closely with the sales and market departments in the role of an advisor on technical problems.

Mr. Sample is widely known in the field of metal finishing, having been directly responsible for corrosion research and the development of protective coatings at Bell Laboratories since 1930.

A prominent member of the American Society for Testing Materials, Mr. Sample is Secretary of Committee B-8 on Electro-deposited Metallic Coatings, Vice Chairman of Committee B-3 on Non-Ferrous Metals, and holds memberships on Committees A-10 on Iron, Chromium and Related Alloys, and B-7 on Light Metals and Alloys, Cast and Wrought. Mr. Sample's other technical and professional activities include memberships in the American Association for the Advancement of Science, American Chemical Society, the Electrochemical Society, and the American Society for Metals.

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To accommodate its expanding sales activities, and to provide further convenience and service to its clients, *United Chromium, Inc.*, has added a Chicago branch to its list of district offices.

Located at 205 South LaSalle Street, Chicago 4, Illinois, it will cover the Central States territory from Wisconsin and Minnesota to Texas and Louisiana. Stocks of materials will be warehoused in this strategically located district to expedite deliveries throughout the area served. The technical services rendered by United Chromium, Inc. will also be operated through this office.

Mr. E. M. Relitz, long associated with the company, has been appointed District Manager. Well known in the field, Mr. Relitz has an extensive and thorough background in all phases of the product finishing industry. Attached to this office to assist him are assistants, C. W. Carter, Gordon Einberger, Frank Keeley and Randolph Stark.

The Puritan Mfg. Co., Waterbury, Conn., manufacturers of buffing compositions, an-



EVEN A SQUIRREL WOULD CHOOSE THE *Shiny* one!



AND IT WON'T FINGER-MARK DURING ASSEMBLY!

No doubt about it, these squirrel cage fan rotors tell the Luster-on* story at its best. Here is an example of small parts extensively used in the electric, electronic and radio industries. Expense and time are important here — yet appearance and surface protection must not be ignored.

Zinc plating alone gives the dark, stained, finger-marked, unattractive product on the right, readily susceptible to white corrosion. But a simple, inexpensive cold-dip treatment with Luster-on* works miracles on that same zinc plate.

Luster-on* makes the surface passive

chemically — gives lasting protection against smudging fingerprints during assembling operations, from corrosion and age-darkening. Luster-on* imparts a gleaming brilliance that sells merchandise by making it more attractive. No fire hazard — no impairment of electrical conductivity — excellent adhesion qualities for paint, lacquer and cements.

Investigate Luster-on* today for your radio and electrical parts, for chassis assemblies, for metal stampings — for better business!

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ounces the appointment of Russell H. Pellington as manager of sales. Mr. Pellington since 1924 has been selling and servicing polishing and buffing compositions in New England states. He is a member of the Hartford Branch of the American Electroplaters Society.

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The L. H. Butcher Co. is pleased to announce the appointment of **Jack A. Raskin** as manager of its electroplating and metal finishing division.

Jack Raskin was formerly chemical engineer for the Udylite Corp. He is a graduate of the University of Illinois, the author of a number of papers, and is nationally known as an authority on electroplating and metal finishing processes.

Albert H. Charlton has been named sales manager of the Aluminum Division of the Reynolds Metals Co., with headquarters in Louisville, Ky., it was announced by **Douglas P. Reynolds**, vice president.

Mr. Charlton joined Reynolds in 1938 and was assigned to the company's sheet mills in Louisville. Later he became an assistant plant manager.

In 1940 he became sales representative for



Albert H. Charlton

Reynolds in Detroit. The following year returned to Louisville and, under **W. F. Reynolds**, helped set up the plants for fabrication of aluminum parts for aircraft. He was made sales manager for the Philadelphia area in 1942 and in 1944 was made eastern sales manager for the Aluminum Division, with headquarters in New York City, which position he held until his present appointment.

A proposed merger of the Parker-Warverine Co. with The Udylite Corp., both

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Detroit, was agreed upon by directors of both corporations and will be submitted at meetings of shareholders of both companies on February 20, 1946, according to an announcement today by L. K. Lindahl, president of The Udylite Corp.

The Udylite Corp., producers of all types of metal finishing equipment and supplies, operates three Detroit plants. Parker-Wolverine produces finished fabricated parts and renders metal finishing service from five Detroit plants. "Integration of these operations will mean better service to industry," stated Mr. Lindahl.

The proposed merger provides for issuance of 2½ shares of Udylite stock for each of the 135,931 shares of outstanding Parker-Wolverine stock.

Charles H. Awkerman, chairman of the board, L. K. Lindahl, president, Clyde H. Reeme, vice president and treasurer and Horace S. Maynard, secretary, along with Willard M. Cornelius and Luis E. Eckelmann are the directors of The Udylite Corp. They will continue as officers and directors of the continuing corporation.

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(Concluded from page 495)

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The sodium hydride descaling process is covered by U. S. Patent No. 2,377,676 held by E. I. du Pont de Nemours & Company, Inc. and is available to interested companies either for laboratory or commercial application, free from license or royalty in the United States.

Acknowledgment

The author wishes to express his appreciation to Mr. N. D. Clare of the Electrochemicals Department, E. I. du Pont de Nemours & Co., Inc., for assistance in the laboratory development of the process and to Mr. A. L. Feild, Director of Research, Rustless Iron and Steel Corporation, and Mr. Fred A. Emm, general superintendent, for their cooperation in the first large scale installation of the process.

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« «

ODDS and ENDS

» »

The all day session of the Electrodeposition Division of *The Electrochemical Society*, held in New York on October 24th, was the first meeting we attended since the O.D.T. clamped down on travelling. About 200 were present, this surprisingly large attendance being undoubtedly due to the excellent assortment of papers assembled by the committee. A number of the familiar names in electrodeposition were on hand, including *A. W. Hothersall*, who came all the way from England.

Most of the papers produced highly animated and very informative discussions. *Ernest Lyons* (Meaker Co.) spoke on surface films and, when he was through, the audience must have been wondering why deposits ever adhered at all. Gratifying to your reporter was the decline, at this meeting, in the use of the term *adherence* when *adhesion* was meant. If the improvement continues at the present rate we will stop harping on this word and start on the pronunciation of the word *alloy*. Not one man in a hundred pronounces it correctly. Look it up in the dictionary if you don't think so!

The remarks by *George Hogaboom, Sr.* and *Dr. C. A. Marlies* (Metaplast Corp.) at the conclusion of Harold Nareus' (Plating Processes Corp.) talk on plating on plastics were so extensive, we wondered why they didn't present papers on the subject also. George and *Dr. C. G. Fink* took unfair advantage of Dr. Marlies by going back to the period 1905-10 for their examples and references—and calling it their young days too! We'll bet they considered themselves darned near middle age at the time.

Gus Soderberg (Graham, Crowley & Assoc.) made a good point during his talk on bright dipping—said electrobuffing was a more appropriate term than electropolishing. When Hogaboom brought in the subject of bran middlings we inquired whether with or without cream but were ignored. He's used to hecklers. In spite of the 20

year old pullets served at the luncheon, the meeting was a great success. We are sure no one was sorry he attended.

Correspondence Dep't.

One of our customers takes us to task for publishing boners which appear in other papers—says *Metal Finishing* has them too. O.K.—you find 'em, we'll publish 'em! Only in our editorial pages, of course. We don't see the ads until they're published and any comments in this column about our advertisers must be nice—after all, we have to eat too!!

As a matter of fact, we don't take typographical errors seriously and report only those which might be amusing to a metal finisher. Such as the *N.Y. Times* ad in which a metallurgist seeks research problems in electro-disposition! A horse of a different color, however, is the type of boner exemplified by the statement in a recent issue of a trade paper—by a chemist—to the effect that a mixture of sodium cyanide solution and copper sulfate results in the formation of hydrocyanic acid gas, when anyone claiming familiarity with the chemistry of plating should know that cyanogen is the gas formed according to the reaction:



Anyhow we're in good company. The editor of *Chemical Industries* spent a good part of his column on the subject last month!

California News:

In our November issue, *Fred Herr* reported from the West Coast that *C. C. McLaren* has retired from the "noxious" solutions in the plating room to operate a chicken farm. From an olfactory standpoint we would say the improvement will be practically nil.

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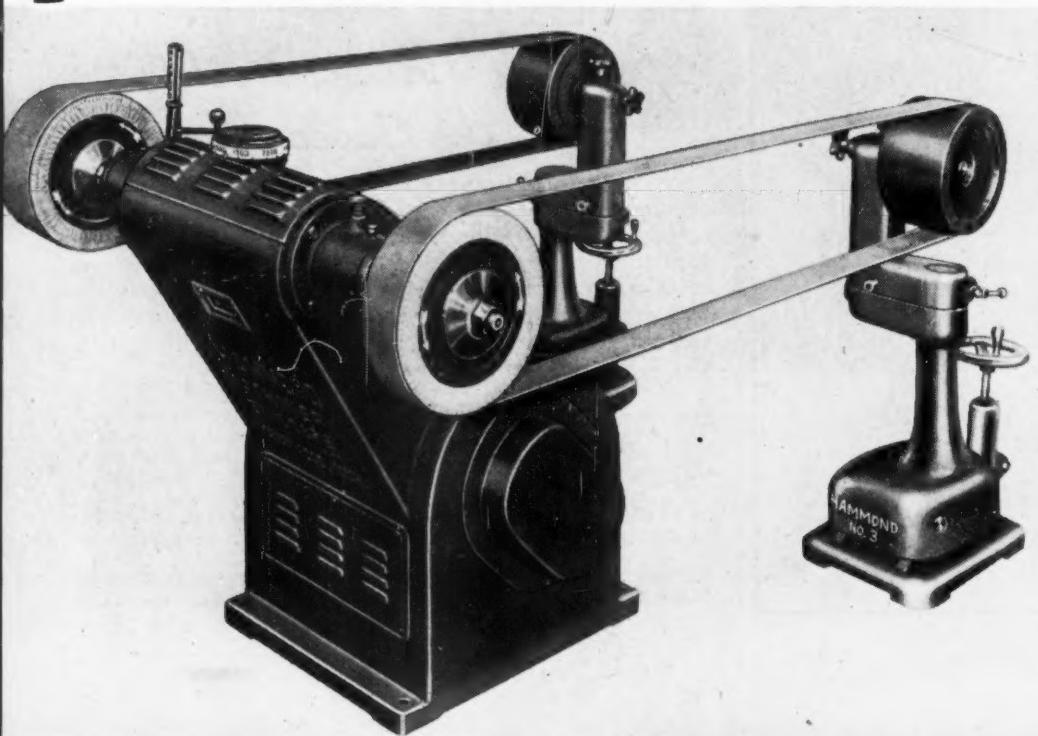
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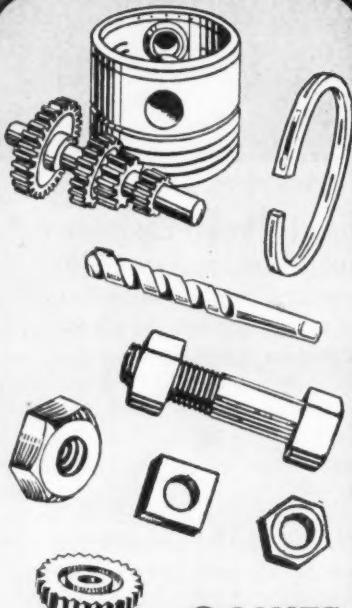
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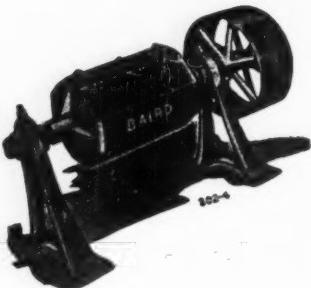
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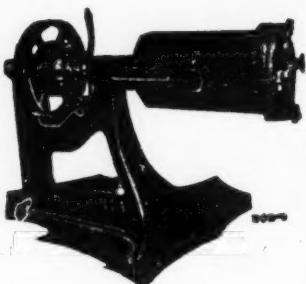
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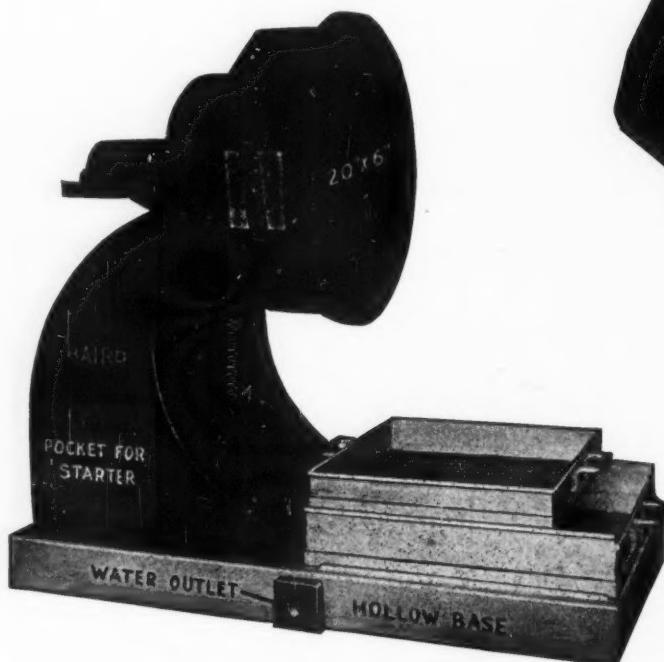
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This shows the side of a No. 1 BAIRD Model D. Single Oblique Tilting Tumbler with a No. 22 Sheet Steel Polygonal Barrel and with an Automatic Electrical Tilting Device.

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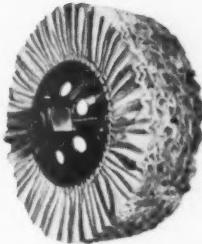
THE BAIRD MACHINE COMPANY
STRATFORD, CONNECTICUT, 9.

Since 1846 specializing in high production machinery for articles of wire and for ribbon metal. Also machines to turn, bore, etc., castings, forgings, etc., up to 10½" diameter.



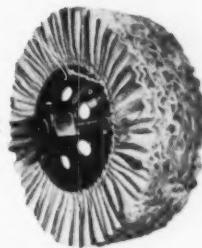
AIRWAY *Ventilated* **BUFFS**—improved and perfected for vital war work—do better work faster and wear twice as long.

AIRWAY *Ventilated* **BUFFS**—



are now available for peacetime production.

AIRWAY *Ventilated* **BUFFS**—are constructed in many different types for all purposes. A wheel for every requirement.



AIRWAY *Ventilated* **BUFFS**—are streamlined for low-cost, post-war production.

Why buy antiquated cotton buffs that double your polishing costs?

AIRWAY *Ventilated* **BUFFS save you**

50%

*MAKE US PROVE IT BY
COMPARATIVE TESTS!*

Write today and state your requirements.

IMPORTANT FEATURES OF AIRWAY *Ventilated* **BUFFS**

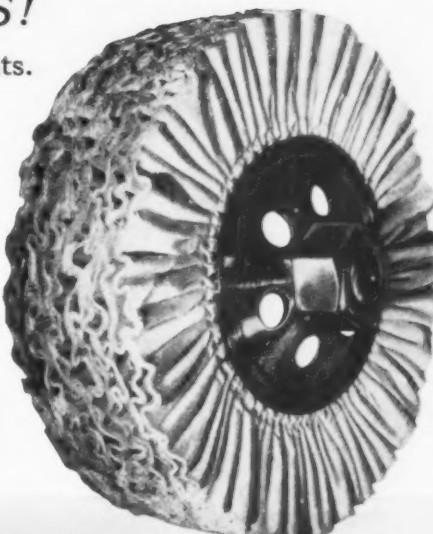
Raveling eliminated, requires no raking.

Eliminates burning.

Faster cutting and does not ridge work.

Saves compound.

WARNING NOTICE—Jackson Buff Corporation of Long Island City, New York, has rights to U. S. Patents Nos. Re 19,894 and 2,140,208 which have broad claims covering an air cooled buff having means for the admission of air through the sides of the buff. Owner intends to protect all rights and stop infringement.



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Nankervis GIVES YOU A Lift

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Developed especially for continuous skimming of acid dip tanks to prevent oil fouling of automatically processed parts. Write for complete details and specifications.

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COMPLETE METAL FINISHING EQUIPMENT



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NO. 64 PROCESS GIVES W-I-D-E-R OPERATING RANGE

You can plate cadmium from one ampere per square foot to 80 amperes per square foot. This means easier and simplified plating, with fewer rejections. ANY SHAPED PART can be plated at 60 amperes per square foot at high efficiency of the direct current used and will deposit approximately one ten thousandth (.0001) inches per minute. This means increased production with savings in man hours and floor space required.

Promat not only operates faster but produces a highly improved quality with more uniform deposit.

Your cadmium plating bath can be converted to the Promat type bath or new Promat concentrated electrolyte can be used for new baths. Promat Maintenance solutions or Promat addition agents are available to maintain the baths. The speed and excellent performance of the process depends upon the use of the Promat "Kicker Unit" which produces superimposed alternating upon direct current.

You will find cadmium plating the Promat way practical, foolproof, and economical. Promat guarantees you new brilliance, improved covering power and faster production.

PROMAT KICKER



There are three lines of Promat Kicker Units: Standard to superimpose 1-6 volts AC; Intermediate 1-10 v. AC; High Voltage 1-14 v. AC. Control is in one-half volt steps. Remote controls as illustrated above Kicker Unit, are available for certain installations. Kicker Units may be purchased for experimental work.

COPPER AND ZINC PROCESSES

Promat also offers individual highly efficient processes for copper and zinc.

PROMAT A/C COPPER. New fast efficient copper plating process dependent largely on super-imposition for fine character of deposit.

PROMAT No. 90-S and No. 90-B ZINC for still, automatic, semi-automatic and barrel plating of zinc. Allows efficient use of high current densities on racked parts, improves covering power, and increases production capacity of equipment.

Promat Pro-Seal:—Simple non-electric post-plating treatment for ZINC or CADMIUM plated parts to produce a new high lustre, improve protection, eliminate finger marking and inhibit the formation of white corrosion particles on zinc.

Distributor's representatives in principal territories.

FILL IN THE COUPON TODAY—NO OBLIGATION, OF COURSE.

PROMAT DIVISION, Poor & Company

851 S. Market St. Waukegan, Ill.

- Please have one of your representatives in our district see us regarding the process checked below.
- Please send us further information regarding the Promat Process checked below.
- Cadmium
- Zinc
- Copper
- Pro-Seal

FIRM NAME

STREET

CITY STATE

ATTENTION OF:

ALROSE

YOUR FUTURE and THE JETAL PROCESS THE WINNING COMBINATION!

Irons and steels have been successfully blackened and protected by the famous Jetal Process for over 12 years. The outstanding performance record created by this long use of the Jetal Process is yours . . . Tailor-made for your future!

THESE JETAL FACTS TELL YOU "WHY"!

- 1 **JETAL BLACK** goes on FAST (actually in 5 minutes).
- 2 **JETAL BLACK** is a deep black coating that has increased value.
- 3 **JETAL BLACK** really wears.
- 4 **JETAL BLACK** won't chip, won't break, won't peel.
- 5 **JETAL BLACK** lasts longer — gives longer life to cutting and lathe tools.
- 6 **JETAL BLACK** costs less.

No current is required to operate the Jetal process which is easily applied by immersion bath.

Chemical oxidation is the Jetal method of blackening ferrous metals. Either way, work can be handled in bulk, baskets or barrels.

For EXTRA RUST RESISTANCE apply Jetal-A, an all-around oil type after-coating. Prove all Jetal claims for yourself — let Alrose "JETALIZE" a sample of your product or ask for a plant demonstration of the Jetal process. Absolutely no obligation.

Alrose Black Finishes For Other Metals Include:

Oxidine B for Blackening Copper and Brass
Oxidine Z for Blackening Zinc
Bon White — An Immersion Tin Finish Giving a Bright White on Copper and Brass — Ideal for a Soldering Base.



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PROVIDENCE, RHODE ISLAND

WILLIAMS 3000-3001



McGEAN

ANODES

and

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Unexcelled for Plating

NICKEL • CADMIUM

**ZINC • TIN • COPPER
CHROMIUM**

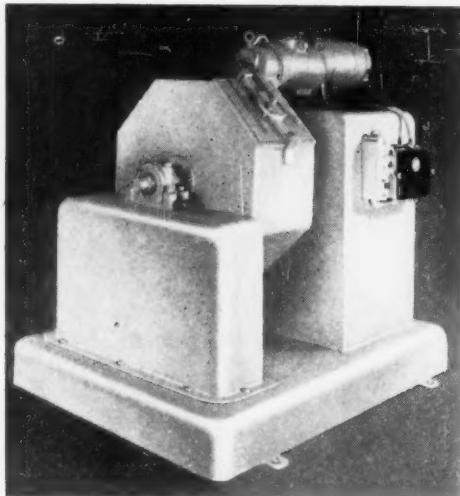
Your inquiries and orders will receive prompt attention

THE McGEAN CHEMICAL COMPANY

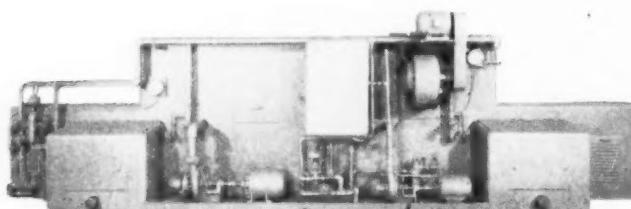
CLEVELAND 15, OHIO

New HOWARD Machines

Deburr without Nicking!



No. 342—This is a single compartment Tumbling Mill which may be used for a variety of processes including Deburring, and many other operations. Equipment includes variable speed motor, reversing switch and jog button and motor brake.

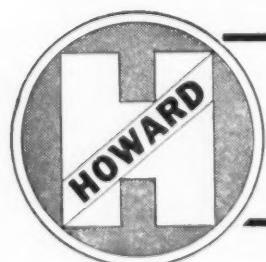


CLEANS and DRY'S AUTO AXLES

No. 339—Howard built this machine to brush scale from the interior of automotive axles. Both interior and exterior of axle are then washed and dried.

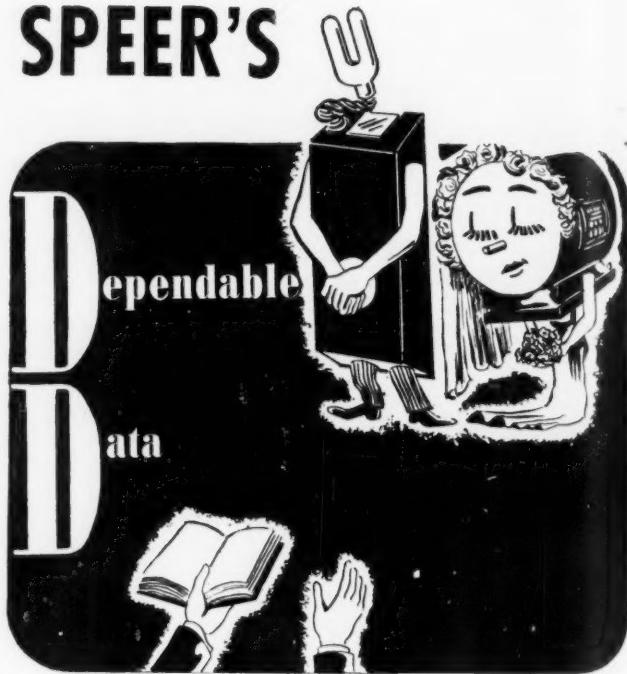
Howard Engineers are specialists in design, methods and application of modern, production cleaning and finishing processes. They are ready to give you prompt action in solving your cleaning and finishing problems. Send us sample parts for free experimental processing and analysis.

WRITE FOR CATALOG AND DETAILED INFORMATION
Machinery for Pickling . . Tumbling . . Deburring . . Washing
Quenching . . Drying . . Burnishing



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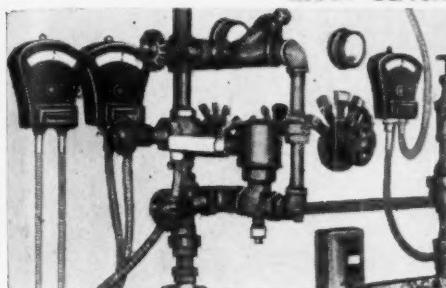
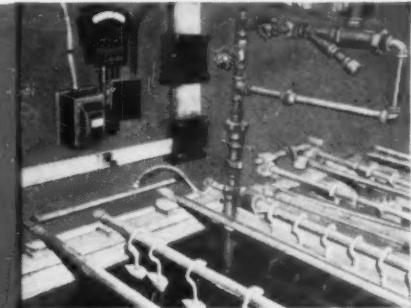
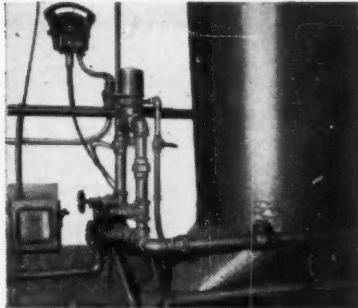
SPEER knows, from long experience, the brush grade best suited for any set of operating characteristics and service conditions. Its all-inclusive line of standard and special carbon, graphite, electro-graphite, and metal-graphite brushes, includes grades that will deliver peak performance in your equipment—with fewest brush renewals, less maintenance.

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Low cost - High accuracy

From high speed copper to chrome, and anodizing to cleaning and rinsing tanks, Sarco has a complete line of temperature controls. The cost varies according to the problem involved, but for the purposes illustrated the simple, inexpensive Sarco LSI Electric Control will do the trick.

It combines accurate temperature indication with automatic control. It is used extensively for both heating and cooling because it costs less, is more reliable and because of the easy adjustment by thumb screw and the built-in dial thermometer.

This is only one of the many Sarco plating controls which range from the low cost Sarco Thermoton, for approximate control of cleaning and rinse tanks, to the highly accurate TR-21 regulator used on many automatic plating operations.

Our representative can show you how others have solved plating problems similar to yours.

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475 FIFTH AVENUE
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ROBINSON'S ASSAYED (100%) GOLD PLATING SOLUTION

First in the Field

Robinson's Assayed Gold Plating Solutions were the FIRST Standardized Liquid Gold Concentrates.

They succeeded because critical technical buyers, in and out of the plating room, adopted them and endorsed them.

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- Gold by weight, not by the quart
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- Economy — Uniform Results

In calculating comparative costs, remember that

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Robinson's label says TROY and Robinson's Gold weights are 100%.

ROBINSON'S ASSAYED POTASSIUM GOLD CYANIDE

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ROBINSON PRODUCED THE FIRST STANDARDIZED LIQUID GOLD PLATING CONCENTRATE

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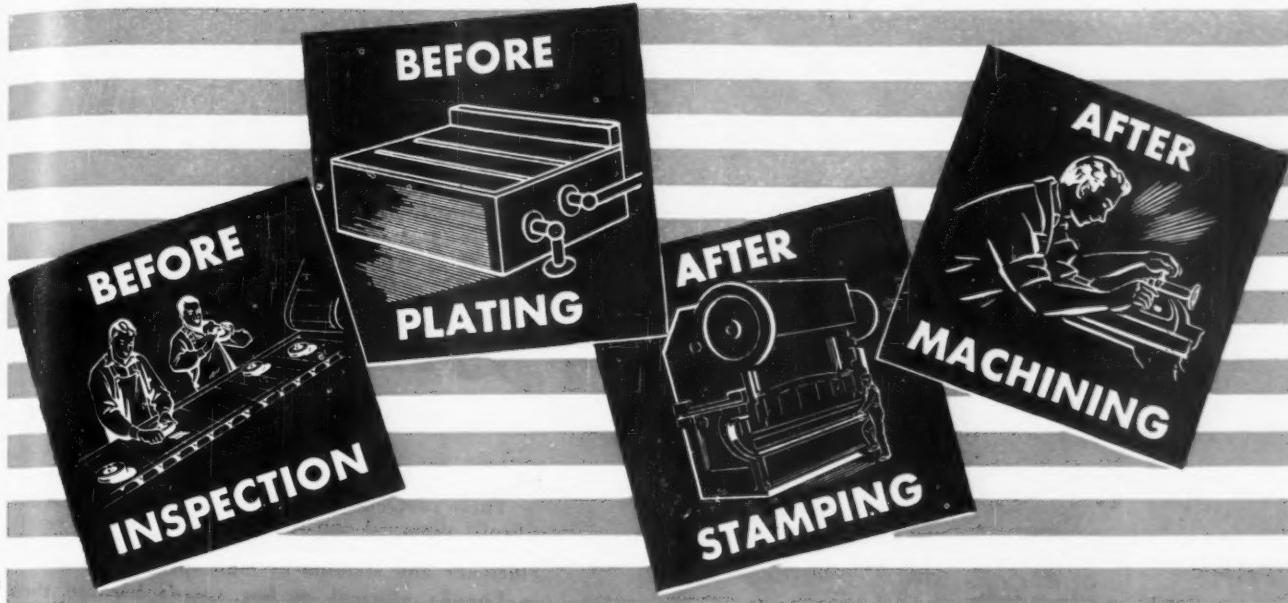
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ROBINSON'S ASSAYED { GOLD PLATING SOLUTION, Color
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SAVE TIME AND LABOR—cut costs—with Vapor Degreasing, a safe and efficient cleaning method. Use it before inspection and plating, after stamping and machining and before and after many other fabricating and finishing steps. To enjoy the many benefits of Vapor Degreasing, you only need specially designed equipment and degreasing grades of Trichlorethylene or Perchlorethylene.

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- 2 **Produces parts clean, warm and dry**—ready for inspection, assembly, further fabrication or finishing of any type.
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- 5 **Can be used alone** or as a part of a process flow line.
- 6 **Utilizes compact equipment.**
- 7 **Consumes only small quantities of solvent.** Contaminated solvent is reclaimed economically.

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- 8 **Uses absolutely pure vapors** of a non-flammable solvent as a cleaning medium.
- 9 **Simplifies cleaning procedure**, is easy to operate as a process.
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BUY VICTORY BONDS—AND HOLD THEM

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These perfected Non-Fray Buffs have been scientifically designed and tested to allow proper ventilation at high speeds. They have no equals for efficiency and stamina at high speeds.

Equally efficient at low speeds because their ventilation and Non-Fray qualities contribute to longer life in production.

*PATENT NOS. 2,027,863; 2,094,650; 1,573,961; RE. 19,894; 2,140,208

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The Only Patented 2-Bath Process
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FOR ELECTROPLATING SOLUTIONS

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Industrial Filters are now coming equipped with AIRWASH—the new cleaning device that does a thorough job of removing sludge from the filter cloths in a few minutes without opening the filter. You will welcome this new labor saving method of cleaning filters.



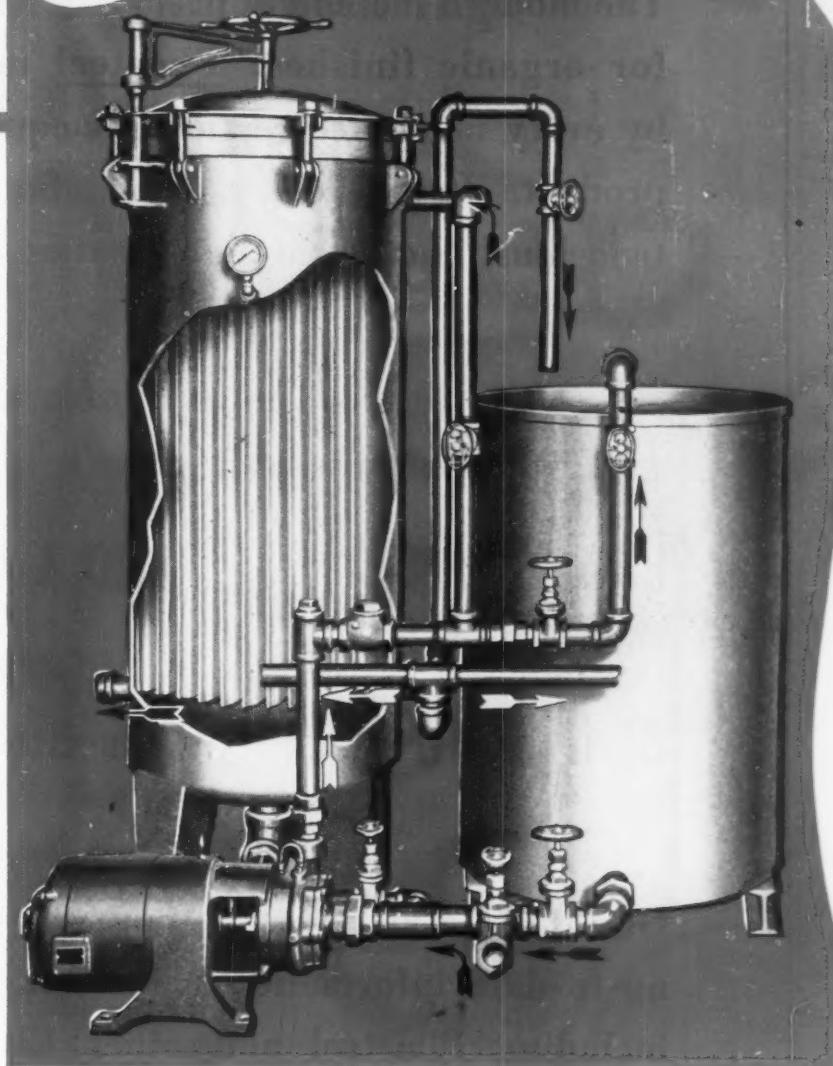
SALT FOG CORROSION TEST EQUIPMENT



This modern instrument is designed to meet all requirements of latest "Salt Fog Testing Procedure Specifications" to determine corrosion resistance of plated, coated, lacquered or painted parts.

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Ideal Filtration and Purification Systems for Use with Large Installations of Nickel, Acid and Cyanide Copper, Brass, High Speed Brite Copper, Rochelle Copper, Brite Zinc, Tin and Other Plating Solutions. Industrial offers larger capacity filters having up to 290 Sq. Ft. of Active Filtration area, facilitating rates to 7200 gallons per hour.

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The modern method of preparing steel and zinc surfaces for organic finishes. Phosteel merits consideration by every manufacturer using lacquer or enamel on his product. It provides an ideal bonding surface which tenaciously holds the final coating.

Du-Lite Phosteel is a phosphate type protective finish with the following advantages:

LOWER COST

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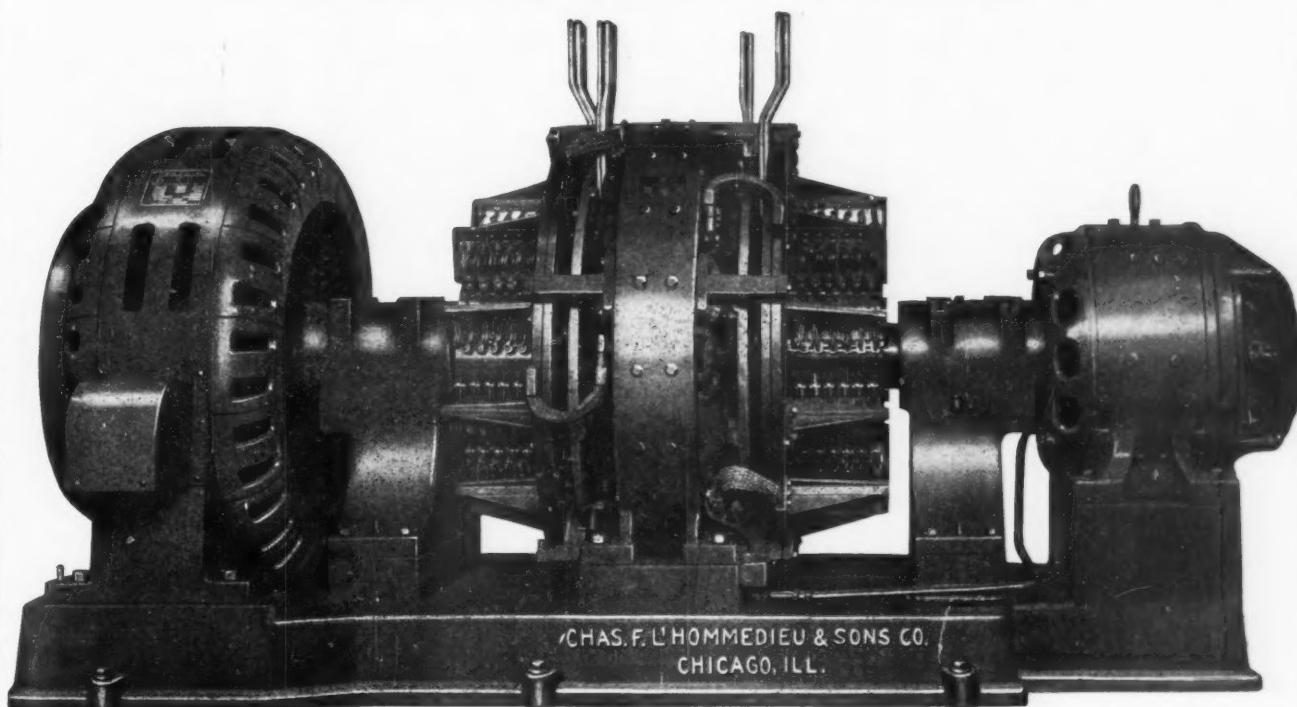
PROMPT SERVICE by
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Our Du-Lite Fact Book—now in its 4th printing—with up-to-date information about the finishing of metals, including Phosteel and other Chemifinishes, will be mailed on request.

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46 Years of Experience Back of Reliance Generators.
In Use Everywhere for Over 30 Years.

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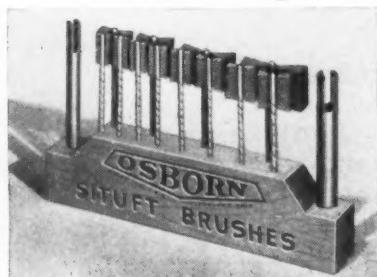


Revolutionary New Power Brush

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Saved thousands of dollars...

OSBORN'S New Miracle Brush—The SITUFT—beats records for deburring, scale removal, thread cleaning, removing rust, corrosion and foreign matter from hard-to-reach places. Can be used on any high-speed press, portable tool or bench grinder.



**SPECIAL TOOL CRIB
ASSORTMENT**
1 each of 12 sizes from $\frac{1}{4}$ " to $1\frac{1}{4}$ " plus 2 holders . . . \$2.85

YOU'VE never seen a power brush like the new Osborn SITUFT. It's built on an entirely new principle of wire suspension. It can do jobs no other brush (in some cases, no other tool) could ever do before. Its cost is almost unbelievably low—17c per brush—yet it has saved thousands of dollars in production costs

for 36 manufacturers in unrelated and diversified industries.

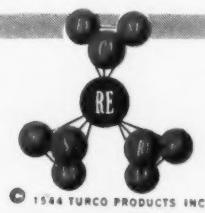
Osborn developed the new brushing tool in the last days of the war to speed the output of military materiel. Now it can help you increase production of your product and at the same time improve it and lower its cost. **AVAILABLE NOW FROM LOCAL OSBORN DISTRIBUTORS!**

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WORLD'S LARGEST MANUFACTURER OF BRUSHES FOR INDUSTRY

Surface Chemistry*—new science of dirt removal—now insures higher standards of metal cleaning and preparation



*THIS IS TURCO SURFACE CHEMISTRY

Surface Chemistry is the scientific balance and application of these cleaning factors to a specific problem.

WA—Wetting Action
EA—Emulsifying Action
SV—Saponifying Value
SA—Solvent Action
CA—Colloidal Activity
WC—Water Conditioning
BI—Buffer Index
pH—Energy of Alkalinity
TA—Total Alkalinity
RE—Research and Experience, the combining factor that puts all the above elements into balance and to work on your specific problem.

HOT TANK CLEANING OF IRON & STEEL

Turco Type X, through Surface Chemistry*, removes grease and dirt from iron and steel by hot tank immersion. Type X emulsifies, saponifies, penetrates, wets out adhesive soils, and conditions hard water. Extremely economical and easy to use.

CORROSION AND SCALE REMOVAL

Turco De-Scaler, through Surface Chemistry*, removes heavy deposits of carbonate scale in cooling systems, radiators, and boilers. *Turco De-Scaler* is a heavy duty compound which dissolves scale without attack on the underlying metal.

Turco W.O. #1—Corrosion and Rust Remover, Through Surface Chemistry*, W. O. #1 removes rust, stains and corrosion without injury to metal. Prepares metal for lasting paint adhesion. Passivates, neutralizes and prevents rust formation beneath paint. Gives a good tooth to which paint easily adheres.

PREPARING ALUMINUM FOR SPOT WELDING

Turco Agiton is a hot tank aluminum cleaner built to provide the highest possible degree of cleaning energy consistent with perfect safety. It withstands considerable agitation without foaming, removes identification markings and zinc chromate primer, along with grease and oil.

Turco Vulco Etch chemically prepares aluminum surfaces for sound, uniform spot welding. A revolutionary cold treatment, carefully controlled in action. Simple to use. Nonhazardous to materials and personnel.

Specialized for the metal working industries, Turco methods and materials cut costs, speed production, guarantee a clean surface no matter what the contamination

Turco has developed many of the finest and most efficient cleaning materials and methods in the country — for gigantic industrial plants — for the Armed Forces — as well as for small one- or two-man operations.

From this experience have come hundreds of specialized industrial cleaning compounds and a wealth of know-how that will help you in your business, regardless of the materials and methods you are now using. Following are a few of hundreds of Turco compounds that will not only help increase the quality of your work, but which will also save you manpower and cut your overhead. A Turco Field Representative will be glad to demonstrate any or all of these products.

PREPARING METAL FOR PLATING

Turco Prosolv B is a remarkable electrolytic plater's cleaner which produces "chemically clean" surfaces. It is approved for stripping tin deposit in the Bullard-Dunn Process, is substantially anhydrous, and completely soluble in hot or cold water. Prosolv B penetrates deeply, contains no soap, is free rinsing.

Turco De-Scaler, used as a pickle before plating, produces smooth, bright, unpitted iron and steel surfaces. Fast acting, thorough, but carefully inhibited against attack on sound metal.

Turco Acryl is a positive inhibitor against attack on metal in acid pickling baths. It is ideal in muriatic or sulphuric vats, either hot or cold. It is completely soluble, nonfoaming, nonpoisonous and noninflammable—saves acid and metal. Safeguards health of workers.

PREPARING METAL FOR ANODIZING, CHROMATIZING AND PHOSPHATIZING

Turco Airlion 81V, an alkaline hot tank material for cleaning aluminum. Airlion

81V produces a solution of intense alkalinity—yet, is harmless to aluminum. It absolutely harmless to aluminum. It cleans by wetting out, rinses freely and leaves a "chemically clean" surface.

GALVANIZING

Turco offers several compounds which, through Surface Chemistry*, save time and manpower and prevent rejects. For example, *Galco*, a hot tank cleaner that removes oil, paint and grease from structural steel preparatory to galvanizing; *Type X* and *Turco De-Scaler* previously described; and *Turco Redi-Paint*, a cold preparation which acts instantly—makes paint stick to galvanized surfaces.

COMPLETE INFORMATION AND DEMONSTRATIONS

It will pay you to get *Turco*'s suggestions. Write on your letterhead for details about any of these *Turco* cleaning compounds, or for free demonstrations in your own plant. Address *Turco*, Department 000.



TURCO

INDUSTRIAL CLEANING COMPOUNDS

TURCO PRODUCTS, INC. Main Office and Factory: 6135 S. Central Ave., Los Angeles 1
Offices and Factories: 125 W. 46th St., Chicago 9 - 1606 Henderson St., Houston 1, Texas
New York Office: 415 Greenwich St., New York 13 - Offices and Warehouses in All Principal Cities

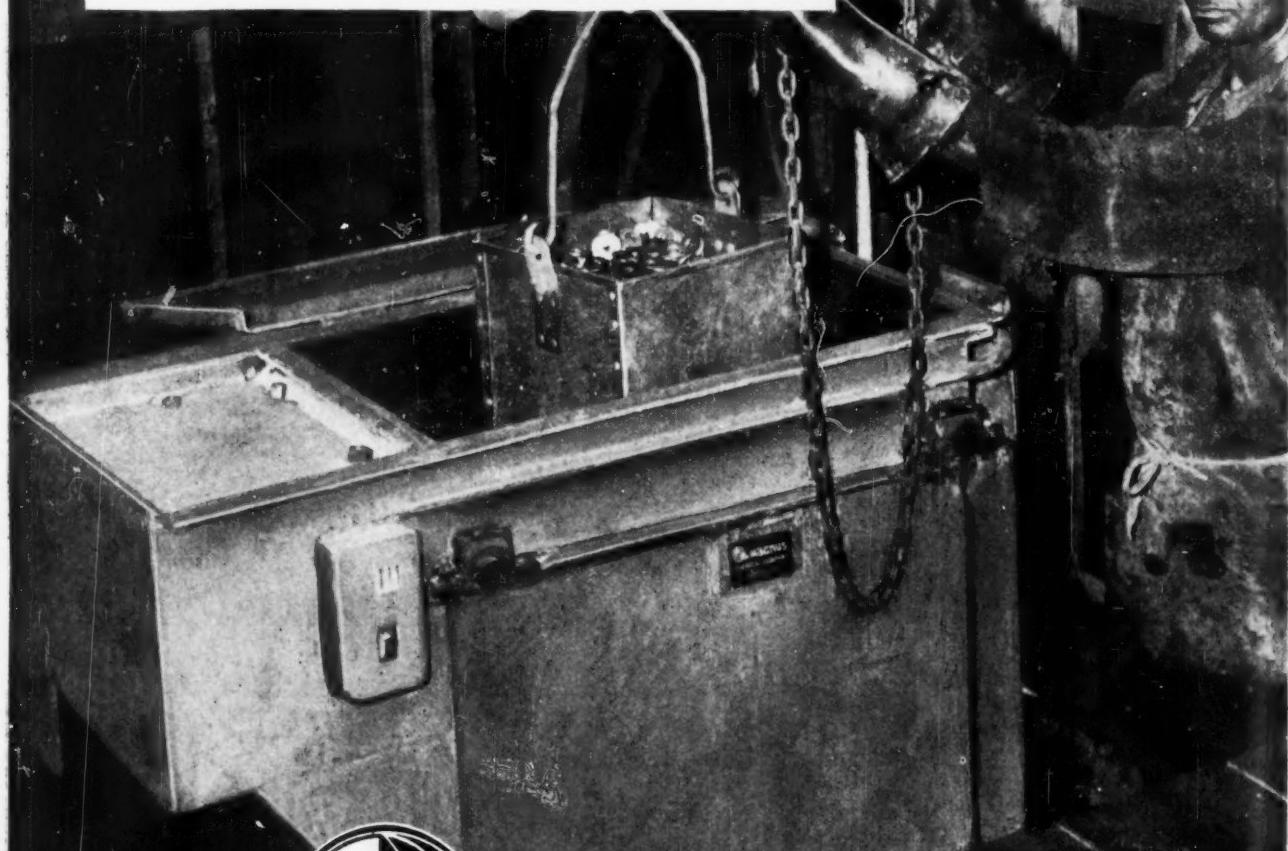
20% Production Boost... Better Cleaned Parts before Plating

Where a soak tank was formerly used for cleaning bolts, nuts, toggles and other small metal parts before plating, now

MAGNUS 94XX with the MAGNUS AJA-DIP CLEANING MACHINE

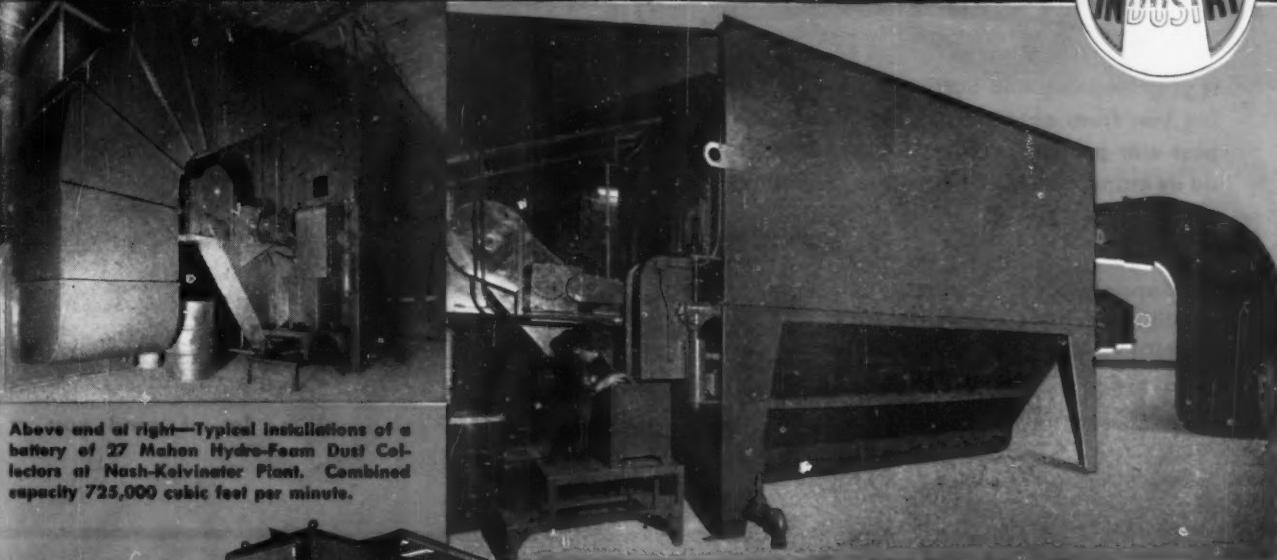
(Patented)

shown here cleans 20% more parts per hour, with a marked improvement in cleaning results. This machine is on the job six days a week, ten hours a day. It will pay you to investigate the unique patented design of the Magnus Aja-Dip Cleaning Machine, which greatly speeds cleaning by the vigorous "shearing" action of the solution on the work provided by agitating the work up and down in the cleaning solution.



MAGNUS CHEMICAL CO., 11 SOUTH AVE., GARWOOD, N. J.
Cleaners • Methods • Machines

MAHON Hydro-Foam DUST COLLECTOR



Above and at right—Typical installations of a battery of 27 Mahon Hydro-Foam Dust Collectors at Nash-Kelvinator Plant. Combined capacity 725,000 cubic feet per minute.

... deposits DUST safely UNDER WATER

Dust control in industry is a necessity today . . . it pays large dividends in health and efficiency of workmen—to say nothing of the fire and explosion hazards ever present where dust from certain combustible materials is permitted to accumulate. The Mahon Hydro-Foam Dust Collector offers to industry a highly efficient means of coping with dust of all kinds—whether it be a nuisance or a real hazard. Even the most minute particles of dust are removed from the air and deposited safely under water. This patented principle is unique, in that it does the job thoroughly without pumps, spray nozzles or screens—the only moving parts being a suction fan and the sludge unloader. Mahon Hydro-Foam Dust Collectors are now serving hundreds of industrial plants throughout the country . . . these collectors are manufactured in standard units of various capacities—they can be installed singly or in multiple batteries to handle any volume of air or any dust condition. Solve YOUR dust problem now.

Address Inquiries to Industrial Equipment Division

THE R. C. MAHON COMPANY

Home Office and Plant, Detroit 11, Michigan
Western Sales Office, Chicago 4, Illinois

Metal Cleaning Machines, Rust
Proofing Machines, Hydro-Filter
Spray Booths, Ovens of All Types,
Filtered Air Supply Units, Hydro-
Foam Dust Collectors—and Many
Other Units of Special Production
Equipment—including Complete
Finishing Systems.

A typical Mahon Stationary Model. This Model is usually located remote from the source of dust—collection is by means of ducts to collector.

Mahon Portable, Ductless Model with hooded, ventilated work bench on one or both sides—an excellent arrangement for burning, grinding and polishing operations.

MAHON

Have You Tried

Is your cleaning and buffing problem preventing you from obtaining the most out of your post-war production program? If so, why not do as many wise manufacturers are doing and use PURICO Pre-Saponified WONDERBAR.

Pre-Saponification eliminates back-breaking scrubbing to clean metal after buffing. PURICO **WONDERBAR** polishes without leaving the usual residue, making simple rinsing adequate for cleaning intricate patterns and crevices.

Start with a Good Finish



Ask one of our distributors in your territory to demonstrate to you the amazing effectiveness of this buffing compound or let us send you a free sample.

Having Trouble Removing the Paint?

USE FIDELITY

Stripping Compounds

Her "paint" has been on for only a few hours and yet she's having trouble removing it. In contrast, the coatings of paint that you run into may have been on for many years. To get them off, you must use efficient stripping compounds — materials that dig in and get right

down to the surface of the bare metal.

The Fidelity label on such compounds is a guarantee of dependability and satisfactory performance. Write or phone us your stripping and cleaning requirements.

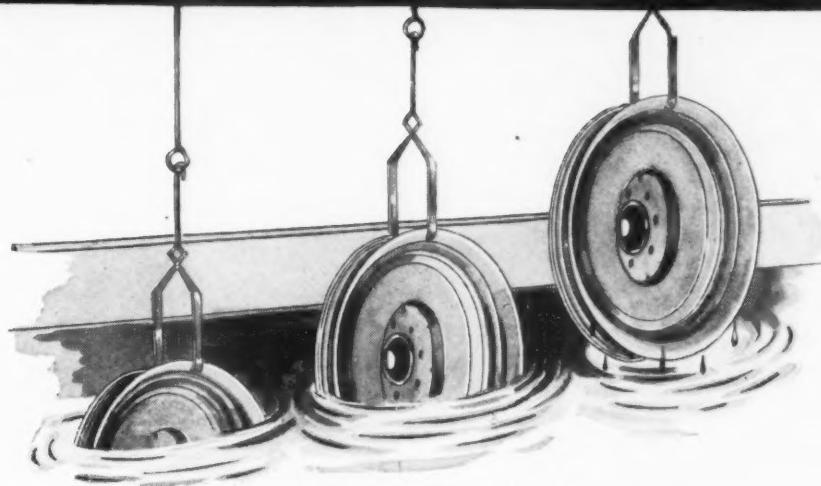


FIDELITY CHEMICAL PRODUCTS CORP.

"Serving industry with cleaning and stripping compounds"

**430 RIVERSIDE AVE.
NEWARK 4, N. J.
Humboldt 3-3640**

PERMITS USE OF ZINC PLATE IN PLACE OF MORE COSTLY MATERIALS



NEW QUICK-DIP PROCESS, ALSO CURBS CORROSION OF GALVANIZING OR CADMIUM

3 WAYS TO BUILD PROFITS WITH IRIDITE

- 1 **As a final finish:** Iridite is available in a variety of attractive colors.
- 2 **As a paint base:** Iridite holds paint firmly, even on die cast or newly galvanized surfaces.
- 3 **To reduce costs:** Consider using galvanized metal, plus Iridite, in place of more expensive materials.

Here's how to use zinc plate in place of more expensive materials. Here's how to curb corrosion on galvanizing, cadmium plate or zinc die-castings. Use Iridite—as a colorful final finish or as a firm paint base! Corrosion-resistant Iridite goes on with a quick dip of 15 to 60 seconds, dries in a few seconds, dries even faster with a hot water rinse, permits immediate handling or shipping. Thus Iridite maintains automatic machine cycles, speeds production, saves time and money.

WIDELY USED

Meeting Army and Navy specifications, Iridite is used on military or civilian products of such manufacturers as Western Electric, Martin Aircraft, Woodstock Typewriters, Sparton, Lockheed and many others. New fields for Iridite are constantly being opened.

SEND FOR TEST PANEL

Send for free test panel, half of it protected by Iridite, and prove for yourself how Iridite barks corrosion... how the Iridite treatment does not alter dimensions of finely machined parts... how Iridited parts may be cold-worked without flaking, chipping or peeling. Find out now whether Iridite can cut costs or speed production for you. Write for free test panel—today! Address: Rheem Research Products, Inc., 14512 Standard Oil Bldg., St. Paul and Franklin Sts., Baltimore 2, Maryland.



Test Iridite for yourself. Send coupon for this test panel.

RHEEM RESEARCH PRODUCTS, INC.

IRIDITE

Standard Oil Bldg., Baltimore 2, Md.

Reg. U. S. Pat. Off.

RHEEM RESEARCH PRODUCTS, INC.
14512 Standard Oil Building
Baltimore 2, Maryland

Gentlemen: Please send me a free panel of Iridite-treated zinc plate for laboratory testing and full information and operating details.

Name.....

Company.....

Address.....

Get **MORE** From Your Plating Tank with...



FAST, QUALITY PRODUCTION

DENSE, DUCTILE DEPOSITS

SAFE, TROUBLE-FREE PLATING

EASY, ECONOMICAL OPERATION

PROVED IN TANKS UP TO 10,000 GALLONS!

NO QUESTION ABOUT IT: high speed volume production is today's most urgent need! As you swing into action, why not take advantage of Unichrome Alkaline Copper? It will pay you immediate dividends in speed, efficiency, operating economies, and quality results.

THESE FACTS ADD UP!

Unichrome Copper deposits are dense, unusually fine grained and adhere well. Their exceptional smoothness

eliminates buffing before plating bright nickel. If buffing is required because the base metal is not sufficiently smooth, it can be done easily with little pressure. A quick, simple, cleaning cycle is used. Deposits need no activation before plating with other metals. The moderate bath temperatures result in lower heat losses. The bath is stable and easily controlled. It has a wide operating range and is replenished at low cost. It is not sensitive to impurities and is less severe on rack coatings. It has

100% anode and cathode efficiency. And it's a non-toxic, non-corrosive solution. Standard equipment is usually satisfactory.

LET US SEND YOU A LEAFLET

Write for leaflet UC that tells you a lot more: properties; characteristics; plating speed tables; important technical details. And why not include a brief outline of your requirements—so we may be of the most help possible more quickly?

OTHER U. C. PRODUCTS AND PROCESSES TO SERVE YOU

CHROMIUM PLATING for wear-resisting, oil-retaining and other types of finishes.

ANAZINC salts for anodic treatment of zinc giving greatly increased corrosion resistance.

UNICHROME DIP for increased corrosion resistance of zinc and cadmium—without electric current.

UNICHROME STRIP for speedy removal of copper, chromium, zinc, etc.

★ Trade Mark Reg. U.S. Pat. Off.

★UNICHROME RACK COATINGS

★UNICHROME STOP-OFF LACQUERS AND COMPOUNDS

★UNICHROME CLEAR LACQUERS

★UCILON—a corrosion-resistant coating for protecting surfaces against acids, alkalies, water, gasoline and various corrosive chemicals.

UNITED CHROMIUM

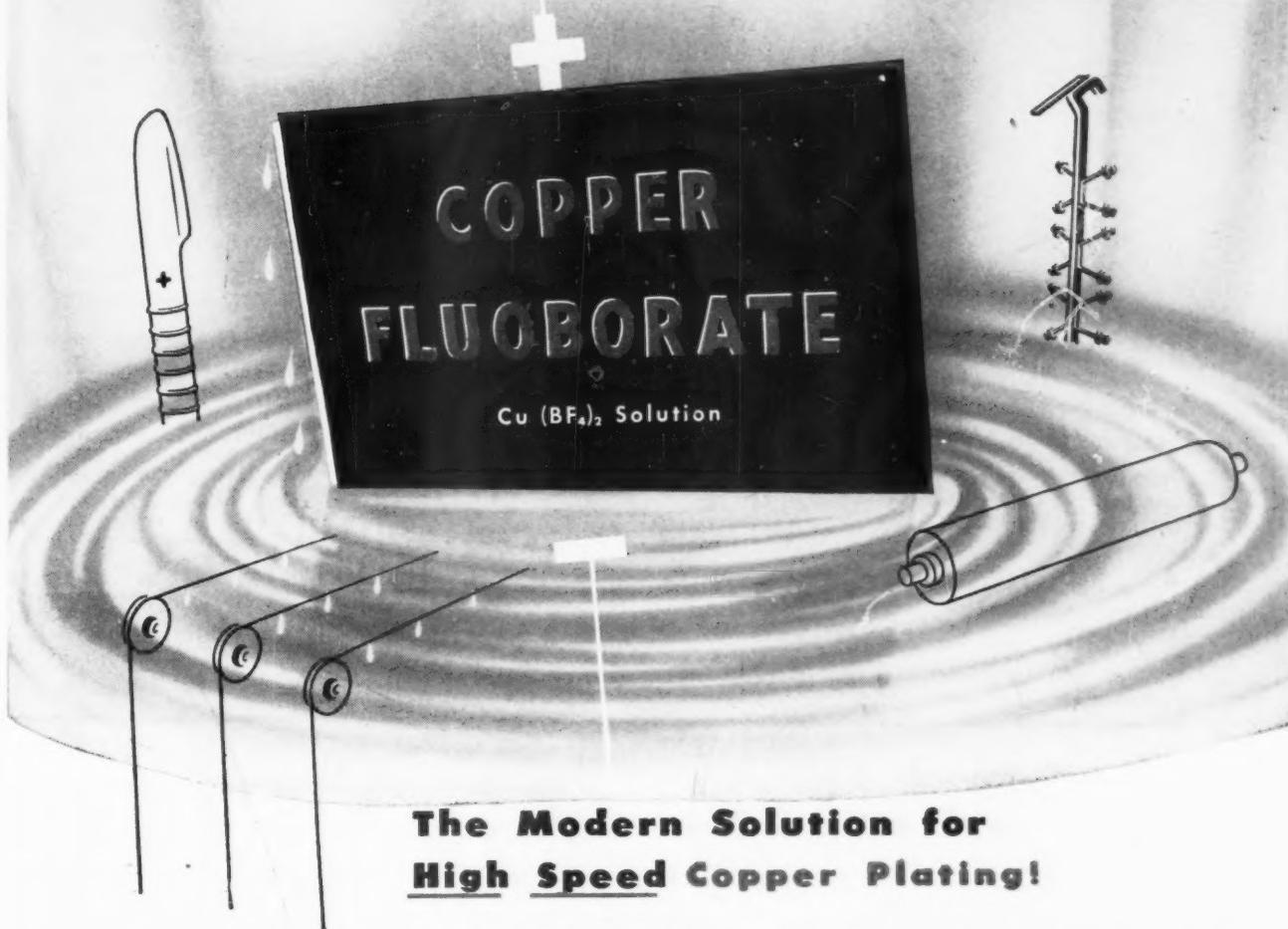
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FIRST IN FLUORIDES . . . Copper Fluoborate is one of many General Chemical Metal Fluoborate Concentrate Solutions now available to Industry in commercial or experimental quantities.

For technical data . . . trial samples . . . or other helpful information on this or other products below, contact General Chemical Company Fluorine Division, 40 Rector Street, New York 6, N. Y. or the nearest General Chemical Sales and Technical Service Office below.

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General Chemical Fluorine Research leads again with another chemical of progress for the electroplating industry . . . Now, *Copper Fluoborate* . . . a concentrated solution that deposits copper at a higher rate than *any other known acid bath*!

Moreover, this superior plating chemical produces semi-bright, fine grained and ductile coatings, as well as plates out heavy deposits when de-

sired. It requires no addition agents and offers unusual simplicity of control.

Total its outstanding advantages. Consider what they can mean to you as an electrotyper, gravure printer, producer of composite copper-nickel coatings, or manufacturer of other copper-clad products that must be plated at the fastest rate consistent with quality work. Then—try General's Copper Fluoborate for your plating!

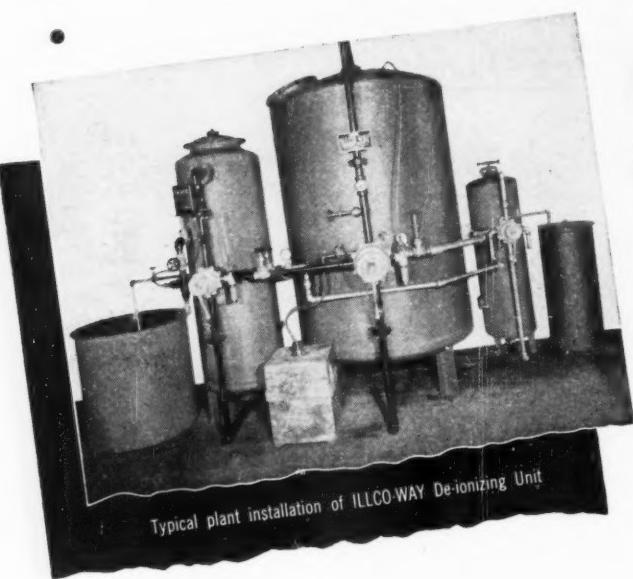
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40 RECTOR STREET, NEW YORK 6, N. Y.

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PURE WATER FOR PLATING at a fraction of former costs!

Better products, at lower unit cost, are produced when mineral salts in water supply are eliminated from plating solutions and rinse tanks. ILLCO-WAY De-ionizing Units are daily producing pure water to meet exacting industrial and technical standards. Cost of the treated water is remarkably low—only a few cents per thousand gallons! Units do not require fuel, cooling water, or periodic dismantling for cleaning. Purification, and reclamation where desired, of industrial wastes is economically possible with other ILLCO-WAY equipment.

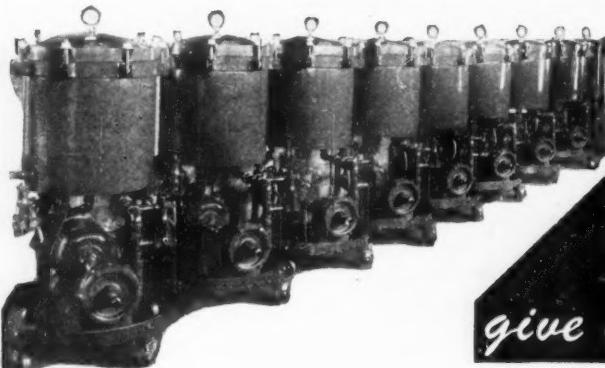
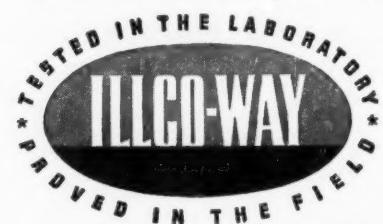
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7310-L12 Empire State Bldg., New York City**

Water Treatment Engineering

DE-IONIZED WATER

REPLACES DISTILLED WATER

Typical ILLCO-WAY unit shown above: installation in a prominent industrial plant; 1,500 gallons per hour. Other available units have permissible flow rates of from 12 to 500,000 gallons per hour.



SPARKLER

HORIZONTAL PLATE

Plating Solution Filters

you **ABSOLUTE CLARITY**

As a Bonus you get:  **LONGER CYCLES
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For accurate, automatic addition of filter aid in continuous filtration:

Sparkler's auxiliary Slurry Tank, Agitator and Proportioning Pump.

WRITE FOR FULL DETAILS.

SPARKLER MANUFACTURING CO.

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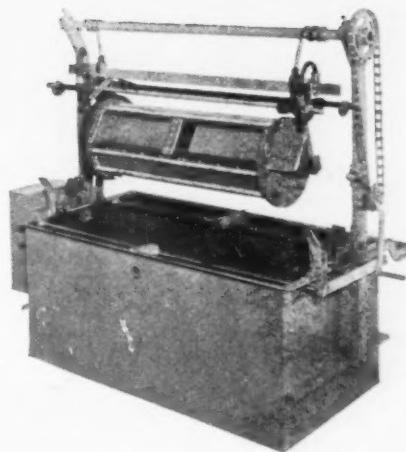


SPEED PLATING BOOSTS PROFITS!

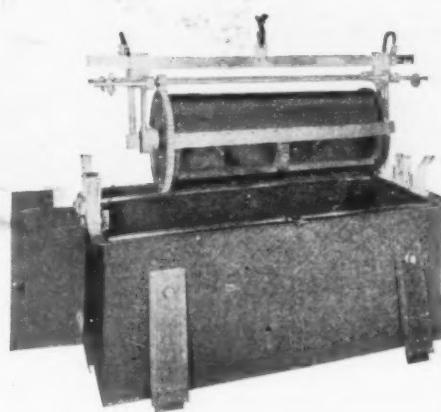
LASALCO'S RICHARDS BARREL PLATER
GIVES YOU THESE ADVANTAGES...

- Negative contact can be arranged to carry up to 800 amps.
- Heavy, flexible dangler imbedded in load gives perfect contact.
- Easily, quickly cleaned negative connection, separated from hanger arms, brought direct to work through hollow hub.
- Selective 3-speed drive.
- Anode rods, conductors, connections and switches are completely insulated from tank.
- Cylinder when lowered goes automatically into exact position thus engaging driving gears and electrical contacts without operator's attention.
- Cylinder construction of 5/16" laminated canvas Bakelite or 3/8" hard bronze rubber (as illustrated). Special rod or woven types also available.
- Sizes, 12" (across flats) by 24", 30", 36" and 42" long for 24, 30, 36, or 42 qt. loads.
- Gear or sheave drive.
- Hand or tackle hoist. Ratchet device holds cylinder in any desired position.
- Effortless, speedy raising, loading, lowering or unloading.
- Nothing plates but the load.

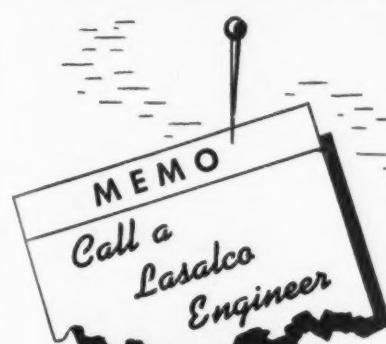
Lasalco's Richards Barrel Plater is a "must" where speed and economy are vital to profits. Write today for complete information!



Motor Drive • Bakelite Cylinder with 5/16" Panels
Slide Doors • Hand Hoist • Gear Driven (or Sheave
Drive if requested).



Motor Drive • Tackle Hoist • Bronze Hard Rubber
Cylinder with 3/8" Panels • Drop-in Type Doors
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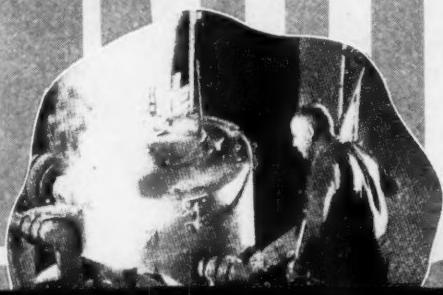


LASALCO, INC.

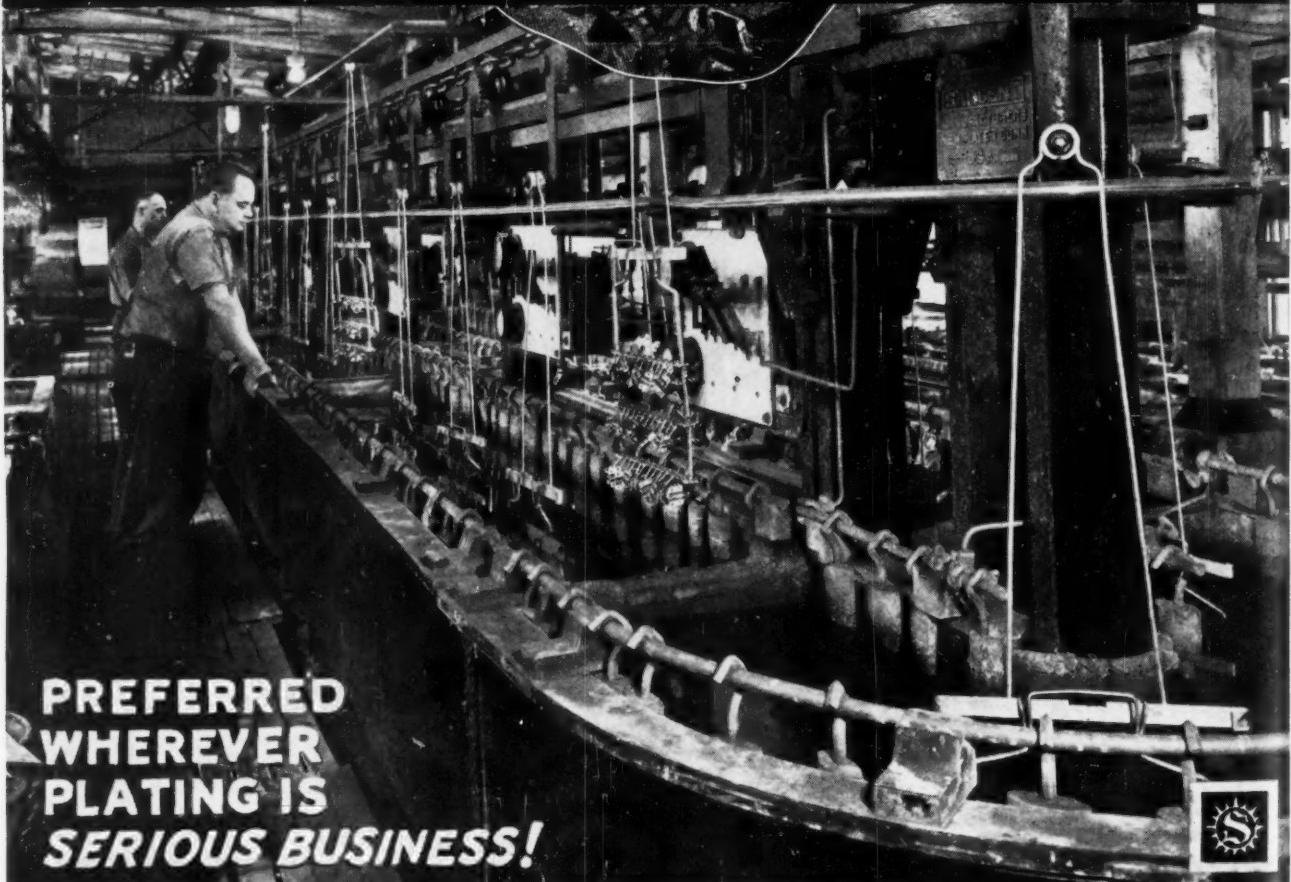
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NICKEL ANODES



**PREFERRED
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PLATING IS
SERIOUS BUSINESS!**



THE SEYMORE MANUFACTURING CO., SEYMORE, CONN., U.S.A.

NON-FERROUS ALLOYS SINCE 1878



THE *Udylite* RHEOSTAT IS BUILT FOR LONG PLATING ROOM SERVICE

The Udylite Plating Rheostat was developed to provide accurate current control, efficient heat dissipation, maximum operating economy, and long continuous service under PLATING ROOM CONDITIONS—high humidity, acid fumes, vapor.

A rheostat of this type is necessary for close tolerance plating.

- All switches are of the self-cleaning cam type which assures clean, efficient contacts every time they are closed. All metal parts are Udylite-Cadmium plated to prevent corrosion. Voltmeter and ammeter are of the best quality obtainable.
- Standard sizes range from 15 to 5000 amperes and voltage drops from 1 to 5. Specials can be provided when required.

This is the
Time to Check
YOUR RHEOSTATS
AND REPLACE
THOSE WHICH ARE
WORN OUT

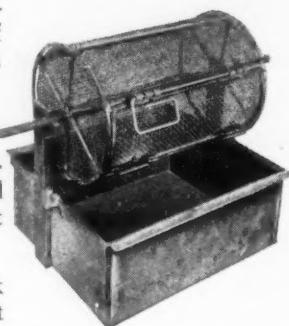
THE *Udylite* CORPORATION
DETROIT 11, MICHIGAN
REPRESENTATIVES IN ALL PRINCIPAL CITIES

ROLICK PROCESSING CARRIERS

FOR ALL TYPES OF METAL FINISHING

The demands for speed and quality in the varied processes of finishing metal parts have shown the need for great imagination in the designing of better Carriers. The competition in industrial production now renewed adds the additional requirement of low cost processing.

As a leader in the field, Rolock presents here three Carriers that have served well for specific duties. Their basic principles can be adapted for custom-built Carriers for your business.



(Above) A small parts washing unit, used near machining station. Low level trunnion brackets permit rotating of barrel in tank, upper brackets for rotating to spill liquid from cupped parts.



(Left) Centrifugal Galvanizing baskets take a tremendous beating from the rapid whirling that spins off excess zinc after dipping. Rolock built this steel basket with the design and strength to give utmost service life . . . at lower costs.

(Bottom) Here's a clinched Annealing and Pickling Conveyor basket for shell case (or similar parts). No welds to crack . . . expansion and contraction with little distortion. Special weave of .250" wire makes flat bottom for use on roller conveyors in any position. Load to 300 lbs. net weight saving 10%.

Write us for Custom-built Baskets, Trays, Crates, Racks and Fixtures up to 8000 lbs. capacity. Save time, cut costs, reduce operator fatigue, save rejects with Rolock Carriers.



CATALOG SHOWS
113 SPECIAL TYPES
COPY ON REQUEST

ROLICK, Inc.
1300 Kings Highway East, Fairfield, Conn.

This winter—

don't let

WET
COLD
WIND
DRYNESS
RAW WEATHER

cause

CHAPPED
ROUGH
CRACKED
WORKERS' SKIN!

USE

FEND-X

INDUSTRIAL SKIN CONDITIONER



for SAFE
ALL-WEATHER
SKIN COMFORT

Healthy hands do a better job in industry . . . and smooth, FEND-X conditioning prevents

the inroads of infection through cracked or chapped skin.

FEND-X conditions the worker's skin by its *normalizing* action—is easy to apply, non-sticky, highly emollient, of light consistency, and suitable for dry or oily skin. FEND-X is an *industrial cream*—rich in essential ingredients—popular in every industry where winter and occupational exposures call for skin conditioning.

Write for the FEND Brochure!

MINE SAFETY APPLIANCES COMPANY

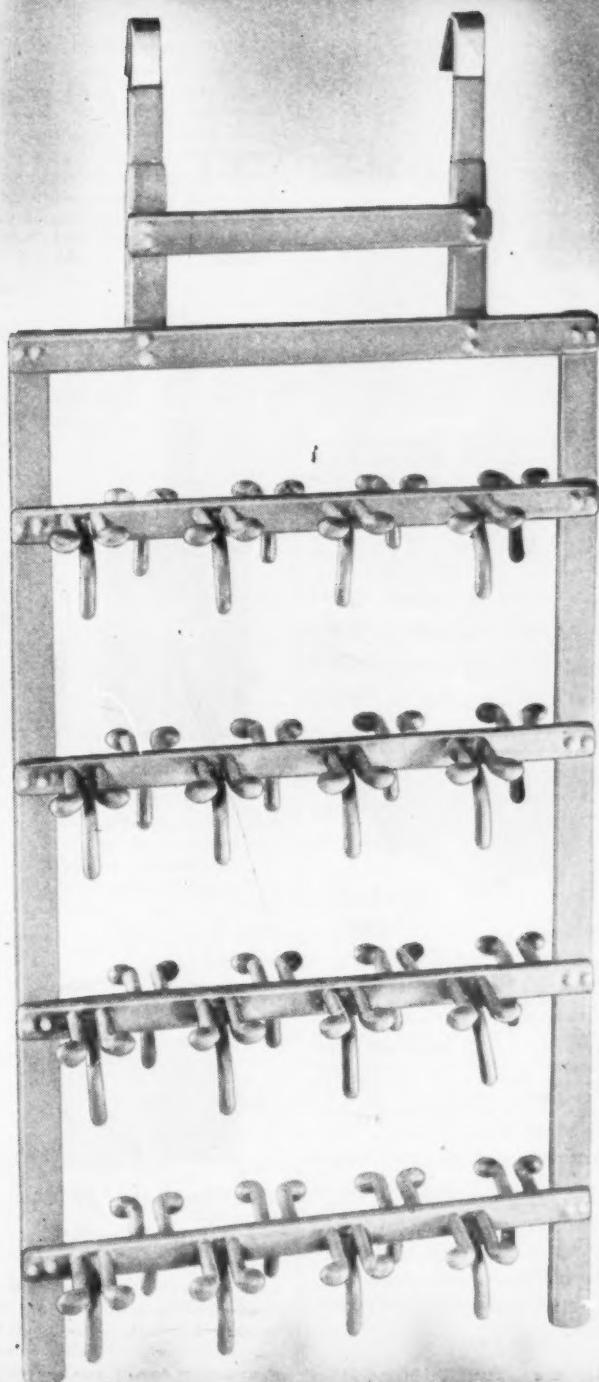
Braddock, Thomas and Meade Sts. • Pittsburgh 8, Pa.

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TORONTO • MONTREAL • CALGARY • VANCOUVER • NEW GLASGOW, N.S.

ARCO SEMI-HARD RUBBER INSULATION for PLATING RACKS IS BACK AGAIN!



Pre-War Semi-Hard Rubber Will
Protect Your Plating Rack Investment

THE WAR IS OVER . . . once more ARCO brings you the most practical and durable insulation for plating racks . . . the same Semi-Hard Rubber insulation that gave you years of satisfactory usage . . . that same smooth seamless surface that rinses easily . . . reduces drag-over and drag-out . . . that saves solution and reduces your solution control costs.

Our modernized facility handles racks in any quantity . . . any size . . . any shape . . . assuring you of prompt service. Our engineering department will work with you on any insulation problem you may have. Write us today . . . and submit dimension sketch or print for quotations.

Sample Splines on Request or Better Yet, Send
Us Production Rack for Sample Insulation

LEADING MANUFACTURERS AND
PLATING RACK FABRICATORS
USE ARCO INSULATIONS

AUTOMOTIVE RUBBER COMPANY
8610 EPWORTH BLVD.
DETROIT 4, MICHIGAN

Kubber Processing

Save Time... Effort... Space... and Money



**Combination
Truck and
Drain Rack**
Loads Automatically

As truck is tilted against drum, steel fingers grip the flange at top. Loading is completed as truck is rocked back to wheeling position. Free-rolling wheels make light work of trucking the heaviest drums. Slight downward push on handles lays truck on floor with wheels raised free, thus providing convenient draining position. Heavy angle iron frame, tubular handles, all welded construction. Two 8" roller bearing wheels. Weight 90 lbs.

Detachable Handles. When used as drain or storage rack, handles can be detached. Thus conserving floor space and permitting one pair of handles to serve any number of trucks.

Item NS-506 \$4250

(Handles welded to frame)

Item NS-506-DH \$4450

(Truck and detachable handles)

Item NS-506-R \$3250

(Item NS-506-DH without handles)

Item NS-506-H \$1200

(Detachable handles only)



Handles with ease barrels weighing up to 1,000 lbs. Weighs but 85 lbs. To load, shove truck up against barrel or drum, then drop sliding steel catch over rim . . . pull toward you and truck loads automatically without rocking or tugging—loads from row as easily as when barrel stands alone.

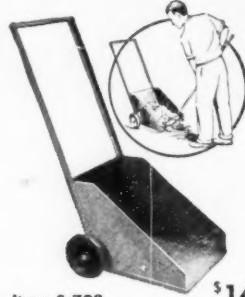
Sturdily constructed of heavy steel, two 10" roller bearing wheels. Greatest width only 22", permitting it to pass through aisles and doors too narrow for many trucks.

Item S-911-M \$3350

Equipped with metal wheels

Item S-911-R \$3850

Equipped with molded-on rubber wheels

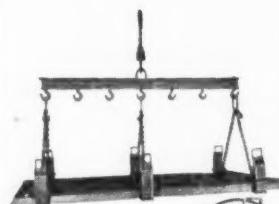


Item S-703 \$1475

Industrial Dust Pan

No shovel to bother with. Moves around in places too tight for a wheel-barrow. Very light to handle. Weighs only 45 lbs. Capacity one bushel. Exceptionally well constructed to withstand rough treatment in industrial plants.

The pan or metal basket which measures 18" x 18" x 18" is made of 16 gauge sheet steel, the frame of 1" x 1½" x ¼" angle iron, the handle of 1" tubing, all welded construction. The overall height is 48". Two 8" rubber tired, ball bearing wheels.



**Item NS-364
Price \$15000**

Complete as shown

Sheet Steel Grab

For handling sheet steel in bundles of any size lift up to 9" thick, 18" to 48" wide, and any length. "Grabs" can be used single, double or triple according to size of bundle; cut shows triple application. Capacity, one ton per "grab"—total, 3 tons. Holds sheets securely without slippage, distortion or damage to stock. Suited to high or low head room. Supporting beam measures 6' long. Heavily constructed. Weight, 190 lbs.

Production economy is the purpose behind the P.S. line of materials handling equipment . . . for pick-up, loading, moving, dumping or storage . . . built of metal, or wood, or combination. Tell us your problems . . . our engineers will gladly recommend and quote on equipment fitted to your individual plant and product.

When ordering: Always use "Item" number to prevent error.
All prices f.o.b. Detroit.

Palmer-Shile Co.
7124 West Jefferson Ave., DETROIT 17, MICH.

Item B-339-A \$2500

Plain bearing metal wheels

Item B-339-B \$2750

Roller bearing metal wheels

Item B-339-C \$3250

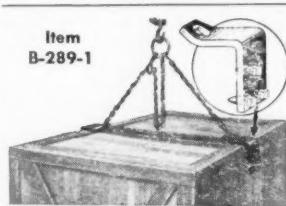
Rubber tired roller bearing wheels



Shovel Truck

For pick-up and moving barrels, hampers or cases; sturdily constructed and easy wheeling. Overall height 48". Heavy steel nose plate, 19" wide at base, 13" wide at front. All welded construction. Two 6" diameter wheels. Convenient shaped handles of heavy 1½" O.D. tubing. Weight 50 lbs.

Item B-289-1



Spike Type Box Grab

For grabbing and lifting large, heavy boxes where the use of spiked grips is allowed. Gripper plates are fitted with replaceable cone-headed spike bolts. Model shown has 1000-lb. capacity; can be used on boxes up to 5 feet wide. Larger models are built proportionately heavier. Four sizes:

Item B-289-1 Cap. 1000 lbs. \$3750

Item B-289-2 Cap. 2000 lbs. \$5275

Item B-289-3 Cap. 3000 lbs. \$6825

Item B-289-4 Cap. 4000 lbs. \$9500



Item NS-298

\$4650

Hand Dump Truck

Constructed of heavy sheet steel, reinforced with band at top edge, stout 5/8" round rod iron handle welded to truck. This truck measures 25¾" by 45" at the top and 25¾" by 27" at the bottom by 17½" deep—carries about ½ cu. yd. and weighs 125 lbs. Equipped with two 8" semi-steel wheels and two 4" metal swivel casters. Weight 125 lbs.



**Item B-205
\$1250**

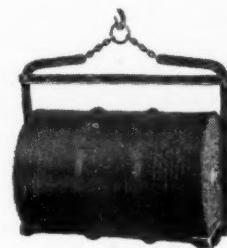
Drum and Barrel Sling

Used for loading and unloading truck, and for general purpose handling. Handy for draining drums. Can pick up drum from laying position and set on end. Will handle drums, barrels, kegs—anything with a lip such as on steel drums or wooden barrels. Heavily welded chain, forged grab hooks. Capacity, 1000 lbs. Weight 8½ lbs.



Barrel and Box Grab

For picking up any type of wood or steel barrel, box or container, from 40" diameter down to small nail keg size. Capacity, 1-ton. Weight 35 lbs.



Item B-416 \$2750

Barrel Cradle

Toggle Type

For picking up any shaped barrel or drum—straight or bilged sides, flat or clinched ends. Ideal for handling flush-end fiber or plywood drums. Also used for handling rolls of paper, carpeting, or other cylindrical packages. Capacity, 1000 lbs. Special sizes to order. Heavy bar stock, welded construction. Weight, 45 lbs.

NOTE: Weights given are in all cases approximate.

ACID CLEANING

AND DESCALING

COMPOUND...

Announcing



PENNSALT



PM-90

**VITAL
USES:**

1. As a pickling bath concentrate in metal finishing shops,
2. As an acid cleaner for removing water scales from feed lines, boilers and a variety of industrial equipment.

**MAJOR
ADVANTAGES:**

1. METAL SURFACE PROTECTION: This carefully manufactured compound is known to give high protection to ferrous metal surfaces. The danger of over-pickling, pitting and high hydrogen absorption will be minimized.

2. REDUCES ACID CONSUMPTION: Compared to an uninhibited acid, Pennsalt PM-90 reduces acid consumption since the acid cleaner is consumed principally in the removal of rust and scale and not in attacking the base metal.

3. IMPROVED WORKING CONDITIONS: Acid fuming is controlled, thus contributing to better working conditions in the plant.

4. CONVENIENCE: Furnished in liquid form . . . can be used either directly from the original container or diluted as much as one part Pennsalt PM-90 to four parts of water. The dilution range will be governed by the speed of cleaning necessary as well as requirements of the particular operation.

PENNSALT PM-90 is packaged in returnable 13 gallon glass carboys containing 115 lb. net. For large consumption, Pennsalt PM-90 is also supplied in tank cars of 4,000 gallons each.

SPECIAL CHEMICALS DIVISION
PENNSYLVANIA SALT MANUFACTURING COMPANY
Dept. MF-12, 1000 Widener Building, Philadelphia 7, Pa.

Kindly send me complete information on Pennsalt PM-90

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____

SPECIAL CHEMICALS DIVISION

**PENNSYLVANIA SALT
MANUFACTURING COMPANY
*Chemicals***

1000 WIDENER BUILDING, PHILADELPHIA 7, PA.

NEW YORK • CHICAGO • ST. LOUIS • PITTSBURGH • CINCINNATI • MINNEAPOLIS
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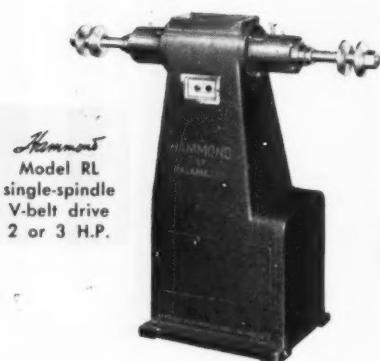
SPECIAL CHEMICALS DIVISION PRODUCTS
Acid, Alkali, and Solvent-proof Cements • Acid, Alkali and Solvent
Emulsion Type Cleaners • Paint Strippers • Pickling Agents • Rust Inhibitor



Hammond
Model RRO
two-spindle
single-spindle
V-belt drive
3 to 7½ H.P.

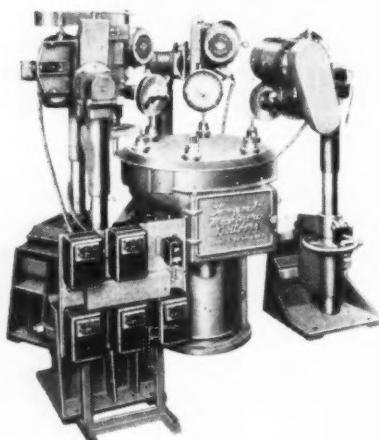


Hammond
Variable Speed
Polishing Lathe,
1500 to 3000
RPM instantly



Hammond
Model RL
single-spindle
V-belt drive
2 or 3 H.P.

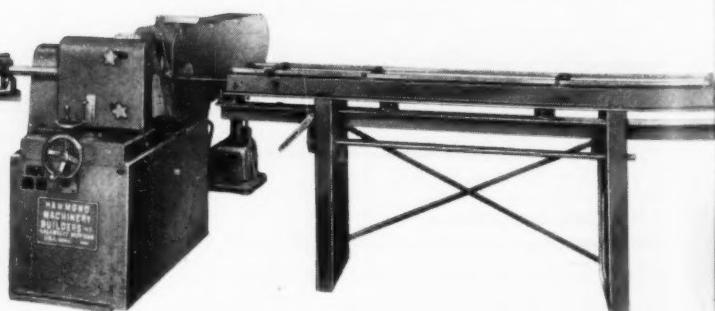
Hammond
Rotary Automatics for hi-production
Polishing, Buffing and Deburring.



Hammond

POLISHING LATHES
AUTOMATIC POLISHING
CYLINDRICAL FINISHING

Hammond of Kalamazoo, builders of good machinery since '82, has kept in the forefront of finishing equipment developments for years. We will continue to maintain this leadership in the future by constant improvements in Hammond Machinery, but every new development will have been tested, as always, in the crucible of practical use. You are entitled to this assurance and you can rely upon it as your yardstick in your standardization or expansion program.



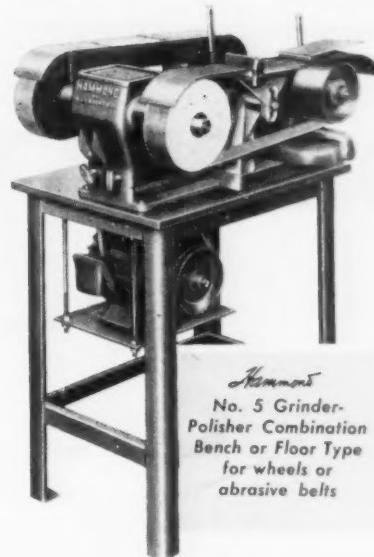
Hammond
"OD" Cylindrical Finishing with wheels or abrasive belts
— handles tubes, rods, bars and other Cylindrical shapes.



Hammond
"400" Vertical
or Horizontal.
Bench or
Floor Type.



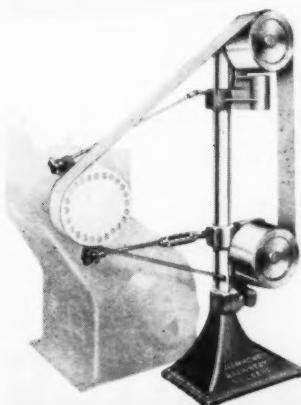
Hammond
F-2 Flexible-
Belt Grinder.
Bench or
Floor Type.



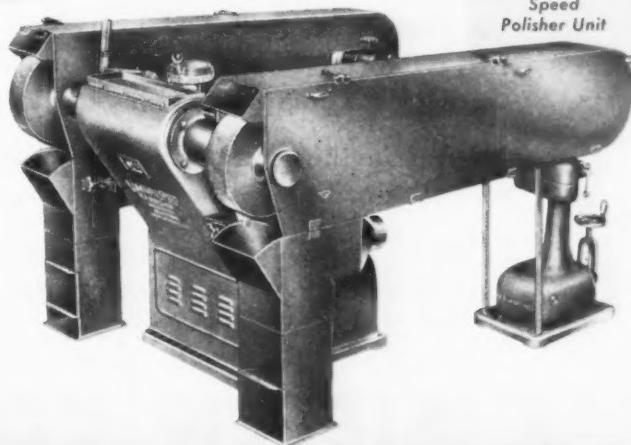
Hammond
No. 5 Grinder-
Polisher Combination
Bench or Floor Type
for wheels or
abrasive belts

OF KALAMAZOO ABRASIVE BELT GRINDERS - POLISHERS and BACKSTANDS

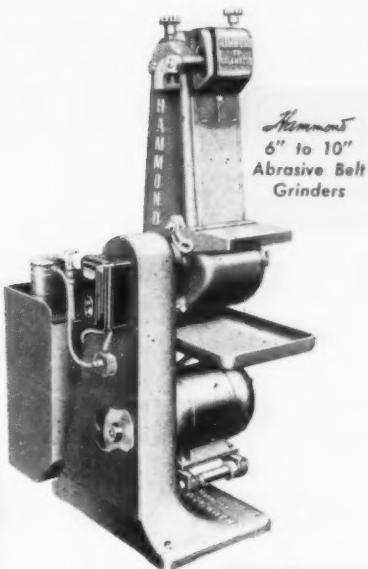
Prominent in the complete line of Hammond Grinding and Polishing Equipment is our Abrasive Belt Line of Grinders, Polishers, Grinder-Polisher Combinations, Flexible-belt and Backstand Units. This relatively new development — the use of abrasive belt machines — has had for its testing-ground the high production demands placed upon it throughout the war years. For faster, better grinding, polishing and deburring round, flat and irregular shaped parts in metal, plastics, wood, ceramics and other materials.



Hammond
No. 4
BACKSTAND
For use with
abrasive belts



Hammond
No. 3
BACKSTAND
and Variable
Speed
Polisher
Unit



Hammond
6" to 10"
Abrasive Belt
Grinders

Hammond Machinery Builders
INC.

1601 DOUGLAS AVENUE • KALAMAZOO 54, MICHIGAN
EASTERN BRANCH: 71 WEST 23rd STREET, NEW YORK 10, NEW YORK

SPRAY BUFFING NU-SPRAY-GLU ON THE BUFF

Don't Waste Time Picking Up the Bar to Rub on Buff

REDUCE MATERIAL CONSUMPTION

**NU-SPRAY-GLU FOR BUFFING
ALL METALS
TO A MIRROR FINISH
FOR HAND AND AUTOMATIC MACHINES**

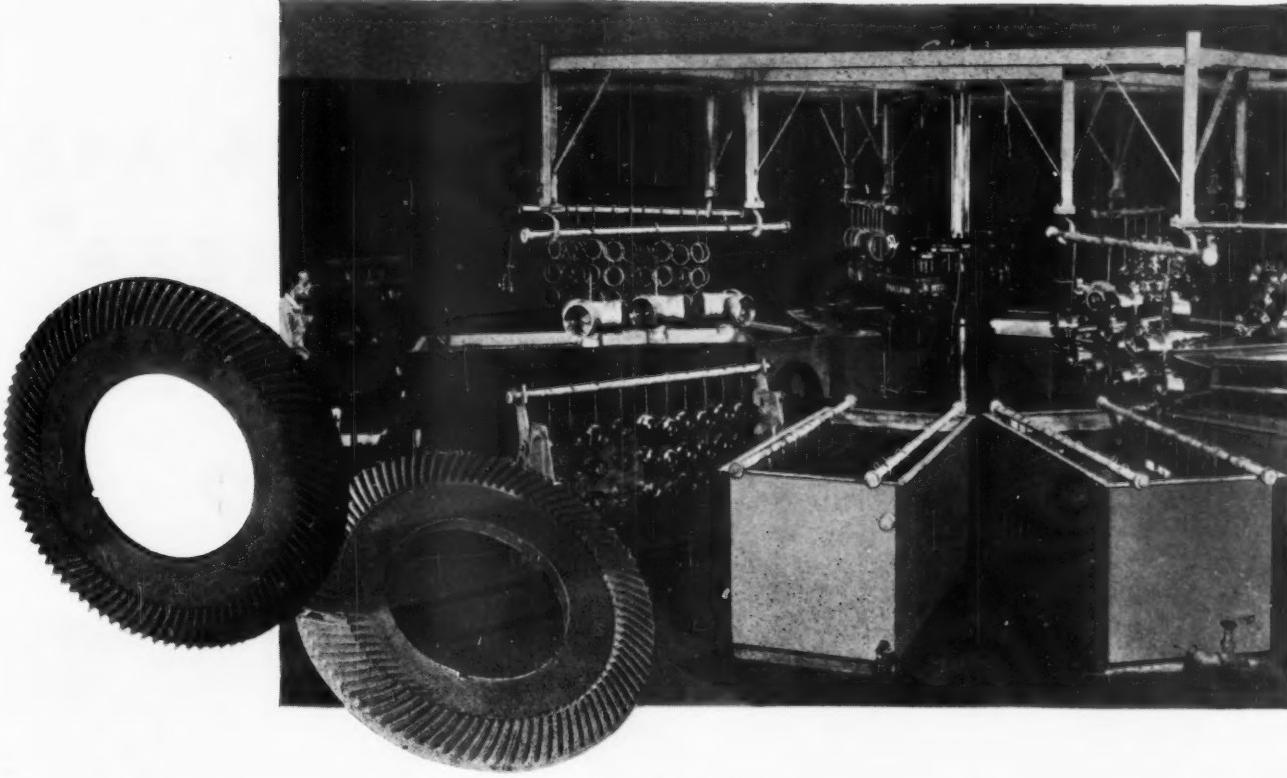
Now you can save time and increase production by spraying compositions on the buff by a slight touch of the foot leaving the operator's hands free. The foot valve releases a small amount of BUFFING NU-SPRAY-GLU. It saves compound as there is no waste. Any factory with compressed air can use it.

It can be incorporated on your automatics and because it cannot get out-of-order, it is better than the old style bar or paste feeders.

This is another new method developed by the J. J. Siefen Co., who have developed many other time and material saving methods.

**J. J. SIEFEN CO., Detroit 9
5657 LAUDERDALE**

Polishing and Buffing Experts



THE *Only* WAY TO REMOVE SCALE AND OXIDE FROM FERROUS METAL ... without attacking the work surface

When dimensional changes are taboo, or when a really clean surface is needed, there is only one descaling method to use . . . the Bullard-Dunn Process.

This is the way it works. While the scale and oxide are being electro-chemically removed, a thin metallic film* is simultaneously deposited on the clean areas, protecting them against attack. This prevents attack 100%.

The process has exceptional throwing power. The scale removal and metal-film protection extend even into deep holes and recesses.

Bullard-Dunn is *fast* because it uses electric current (low voltage) . . . *economical* because material and labor cost is low . . . *practical* because it is easy to operate. It *expedites production* because it gives dependable, uniform, day-to-day service. Good equipment is available for both manually-operated and conveyorized units.

To demonstrate the many advantages of this process, we are always glad to treat representative samples of your work. Meanwhile, have us send you Bulletin TR-BD.

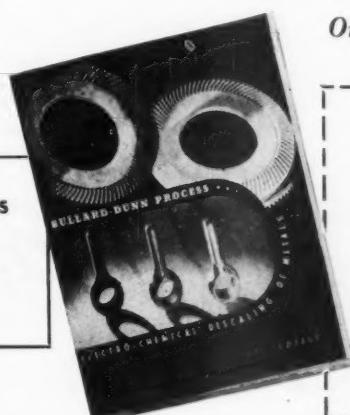
WHEN TO USE THE BULLARD-DUNN PROCESS

1. To remove scale completely for grinding, plating, inspection, etc.
2. To remove scale from work that cannot stand dimensional changes.
3. To clean out internal surfaces.
4. To clean and lubricate surfaces for hobbing or drawing.
5. To clean and provide base for soldering hot tinning or paint.
6. To clean rubber molds.

*This metallic film can be quickly and easily removed when a chemically clean work surface is desired.

Only Bullard-Dunn descales without dimensional change

FOR FULL FACTS
MAIL
THIS COUPON
TODAY



THE BULLARD COMPANY, Bridgeport 2, Conn.

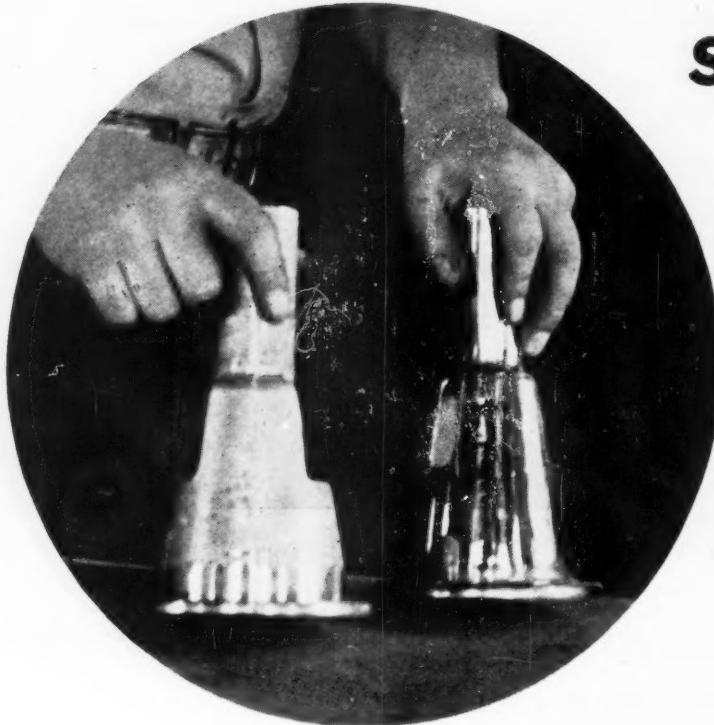
Please send me Bulletin TR-BD describing the Bullard-Dunn Process.

Name

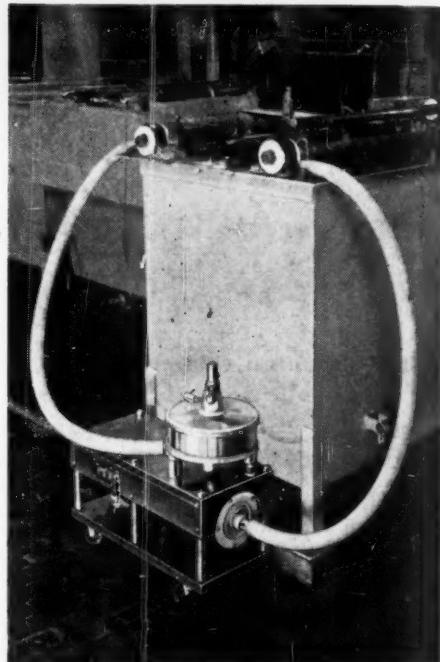
Company

Address

HOW CAN PLATERS MEET RIGID SPECIFICATIONS AND STILL KEEP COSTS LOW



?



- The biggest task facing plating shops is to meet the generally tightening finishing specifications and still maintain reasonable costs. How can this be done?

Here Is One Way: Filter Plating Solutions

Contaminated plating baths extract an immense toll in costs by raising rejection rates, increasing polishing labor and lengthening plating time. All this adds up to unnecessary production costs that can be avoided by filtering plating solutions.

And Here Is The Equipment: ALSOP "Sealed-Disc" FILTERS

Alsop "Sealed-Disc" Filters are best suited for filtering plating solutions for several reasons, including: Speed (multiple filter surfaces give efficient filtration at highest possible volume); Simplicity (no filter aids are required and the units can be cleaned fast); and, Adaptability (Sealed-Disc Filters can be portable or stationary, and in any size to meet requirements).

Note contrasting sizes of Alsop Filter and tank. This compact filter can handle a lot of solution.

Write today for complete information on ALSOP "Sealed-Disc" FILTERS, giving type and size of plating baths. There is no obligation, of course.

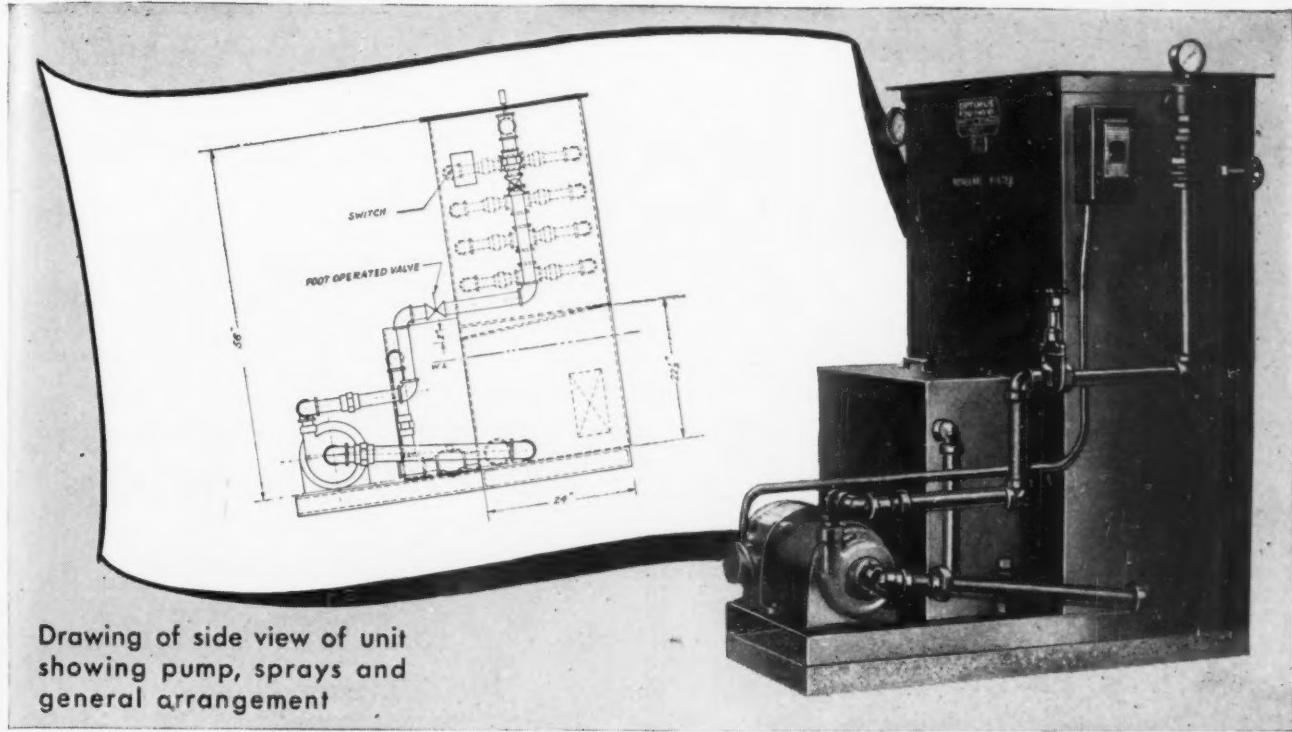
ALSOP Engineering Corp.

42 Bright Street

Milldale, Connecticut

12-AL-3

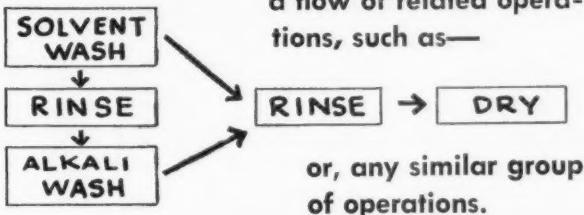
METAL FINISHING, December, 1945



For better cleaning and rinsing of rack-handled parts . . .

THE problem of eliminating slow hand cleaning and rinsing of small metal parts on racks in the plant of a large metal goods manufacturer, has been adequately met with the installation of a series of OPTIMUS Spray Rinse Machines, like the one shown above. These compact units, which come equipped with pump and sprays, can be used individually, or they can be used in a series to handle

a flow of related operations, such as—



or, any similar group of operations.

These machines, which are exceedingly low in operating costs, are ideal for use before, or after, plating, or before painting. Racks may remain stationary, or they may be moved thru the spray range automatically.

Units can be heated by any heating medium, and can be made to any dimension, small or large. Machine may be installed in a pit to permit easy access at proper working height. Spray system is operated by foot pedal valve. Similar controls can be included for other purposes.

SEND FOR—details showing how these OPTIMUS Spray Rinse Machines can be applied to your plant operations.

**OPTIMUS EQUIPMENT COMPANY
ENGINEERS AND MANUFACTURERS**
127 CHURCH STREET, MATAWAN, N. J.

STANDARD AND SPECIAL TYPES OF EQUIPMENT FROM THE SMALLEST TO THE LARGEST SIZES FOR A WIDE VARIETY OF OPERATIONS.

OPTIMUS



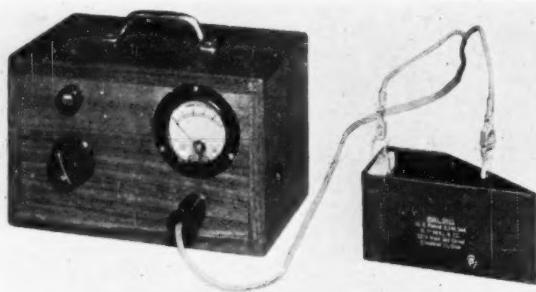
EQUIPMENT

FOR WASHING • RINSING • PICKLING AND DRYING OF METAL PARTS



MODERN PLATING DEMANDS

Plating Test Control
of Your Plating Baths



Hull Cell Test Set

THE HULL CELL
Is The Recognized Method
for Plating Tests

R. O. HULL & COMPANY

1279 West 3rd Street
Cleveland 13, Ohio

We are Pathfinders
for Electro-plating

We have been leaders in research and development in the plating field for many years, particularly in the realm of the precious metals. Our contributions to the advancement of this art have been notable—the development of the process for plating with rhodium is one outstanding instance.

Electro-plating with platinum, palladium, rhodium, and gold for special applications, notably in electronics, radio, radar, telephone and other means of communication, often may require research and experiment. Here is where our long experience and familiarity with the peculiarities of the precious metals will be of great value to you. We are always ready to work with you on any such problems.

Among our precious metal products for the plater are:

Aurosal—gold oxide

Potassium-gold cyanide 41% and 67%

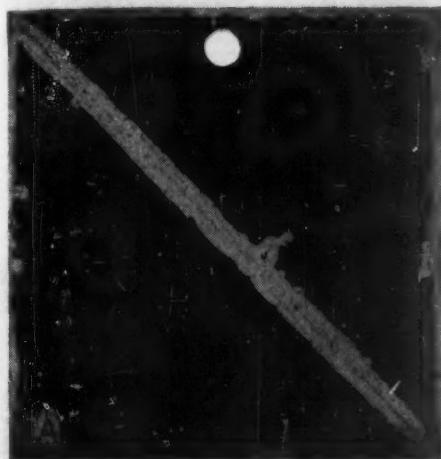
Sodium-gold cyanide 46% and 71½%

BAKER & CO., INC.

113 Astor Street

Newark 5, N. J.

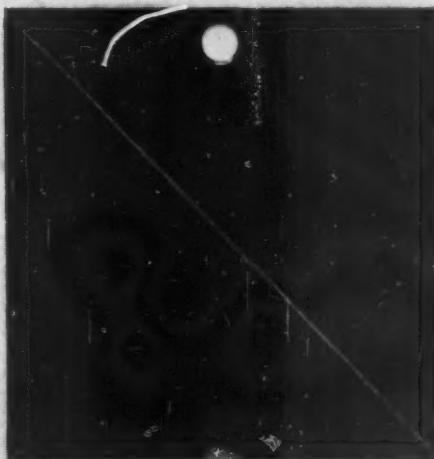
Paint Finishes Endure on Properly Cleaned and Conditioned Surfaces



CLEANED with ALKALI

The superior performance of a good paint system on a surface properly cleaned and conditioned with 210 B DEOXIDINE.

Even a good paint fails prematurely on a poorly prepared surface as illustrated by the Alkali cleaned panel.



CLEANED and CONDITIONED with 210 B DEOXIDINE

Identical Salt Spray Exposure

CLEAN AND CONDITION SHEET METAL

with

210 B DEOXIDINE

THE 210 B DEOXIDINE process is the simplest and most advanced procedure in metal preparation for paint. A minimum of low-cost operating equipment is required therefore, less than the usual amount of operating space is needed. The fewer necessary operations cut the production costs. Time and labor are saved and better results obtained.

APPLICABLE TO LARGE METAL PRODUCTION

210 B DEOXIDINE is ideal for completely mechanized spray process in power spray washers constructed of mild steel. A three stage washer is usually sufficient, but four stages are preferable if drawing compounds are present.

A NATURAL FOR THE SMALL PRODUCTION PLANT

210 B DEOXIDINE does not require expensive stainless steel equipment. Three stage washers which have

previously been used for alkali cleaning can be used. The simplicity of controls of 210 B Deoxidine bath and process lead to uniformly good results.

210 B DEOXIDINE is but one of several war-proved Deoxidines — each created to meet differing conditions. ACP Technicians will gladly advise with you and suggest the particular ACP products and processes which will efficiently meet your cleaning and conditioning problems. Write to Dept. C-12.

MANUFACTURERS OF INHIBITORS AND METAL WORKING CHEMICALS

AMERICAN AMBLER

Office and Warehouse
3665 Palmer Ave., Detroit, Mich.

ACP CHEMICAL PAINT CO.
PENNA.

Canadian Office and Factory
Walkerville, Ontario

West Coast
Leon Finch, Ltd., 728 E. 59th St.
Los Angeles, Cal.

Metropolitan New York Area
Bricker & Andes, 318 Atlantic Ave.
Brooklyn, N. Y.

Eastern Ontario and Quebec
Van Camp Products & Sales Co.
177 Parliament St., Toronto, Ont.

You Won't Get Far With a Half-Way Job



. . . Do the whole job and do it right

Half-clean electroplating baths are trouble makers. They mean time and expense lost in doing jobs over. Keep your plating solution clean all the time! Remove the contamination that slows up production!

You can do the job easily with DARCO S-51, and it will cost you only a few cents a week. DARCO S-51 is an activated carbon that removes impurities that cause plating headaches—pitting, spotting, poor adhesion. By a continuous process of adsorption it takes out, and keeps out grease, oil, soap, colloids and other decomposition products from the plating bath.

Order DARCO S-51 from your dealer today, or write direct for a sample. DARCO can be used with many types of solutions—bright nickel, acid or cyanide zinc, cadmium, iron, copper, gold, silver. It has no effect on the metal content of the bath.

Darco activated carbon is a fine black powder. It is used in conjunction with a filter. For detailed directions send for copy of an article, "Physical Removal of Impurities from Plating Solutions."

Remember, too, if your purifying job is an especially tough one, our DARCO engineers will be glad to help. They'll assist you in keeping your plating baths clean—in keeping them as clean as the water in your final rinse.

This trademark identifies the genuine. Accept no packages without it.



DARCO
CORPORATION
60 East 42nd Street, New York 17, N. Y.

DARCO—REG. U. S. PAT. OFF.

Is Your Plating Bath as Clean as the Water Used in Your Final Rinse?

Just a little shaver



But is his beard tough!

The case is often the same with cleaning metals—a small job may be hard to handle.

With most jobs it makes no difference, though, whether the work is big or little, simple or involved—if you use Wyandotte Metal Cleaners. There's one of these specialized degreasing compounds to fill just about any metal-cleaning need—for

cleaning after machining and prior to plating, painting, lacquering, blackening, anodizing, spot welding. . . .

And you'll find the Wyandotte Representative fully equipped, too, with the knowledge and experience necessary to help you with your metal-cleaning jobs. Call him today and let him show you the many advantages of Wyandotte Metal Cleaners.

WYANDOTTE CHEMICALS CORPORATION • J. B. Ford Division
Wyandotte, Michigan • Service Representatives in 88 Cities



Wyandotte
REG. U. S. PAT. OFF.



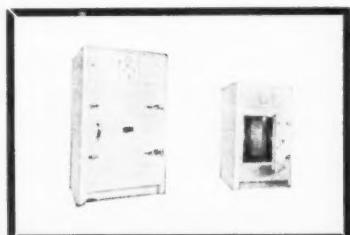
assure Better, Faster Product Finishing

Remarkable developments have been made in finishing operations during recent years. New techniques have substantially reduced drying time and lowered costs, as well as improving the quality of the finish.

To keep ahead in the greatly stepped-up race of competition, you will need these superior oven advantages in your business.

Our staff of experienced oven engineers, with the entire fund of advanced finishing techniques at its disposal, selects those methods which are best suited for the individual job. They then plan, design, and install a "custom built" oven guaranteed to provide maximum speed and quality in product finishing at minimum cost.

Names of nationally known industrial plants using Kirk & Blum drying, baking, and laboratory ovens, as well as additional information about our services, will be gladly supplied on request. Write the Kirk & Blum Manufacturing Co., 2859 Spring Grove Ave., Cincinnati 25, Ohio.



KIRK AND BLUM
AN ORGANIZATION OF
ENGINEERS AND MECHANICS

RICHARDSON-ALLEN

Rectifiers

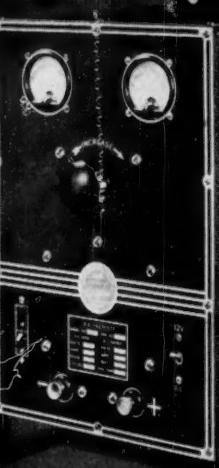
VARIABLE
Platers

SINGLE
Platers

DOUBLE UNIT
Platers

CUSTOM BUILT
Platers

Thickness
Platers



Rectifier models: D190A, D191A, and D207A are particularly adaptable for electro-chemical applications. Designed around a long life Selenium Rectifier, they operate at: 25 amps., 6 V., convection cooled; 37/75 amps., 12/6 V., and 75/150 amps., 12/6 V., fan cooled. All units are designed for operation from 115 V., A.C., single phase, 60 cycles. Output is continuously variable from zero to full load by one control. Complete overload protection. Automatic protection against fan failure and ventilation restrictions on fan cooled units. Banks of units can be combined to increase power rating. Output voltmeter and ammeter. Wall or bench mounting.

For special Selenium D.C. power requirements write for Rectification Questionnaire and literature.



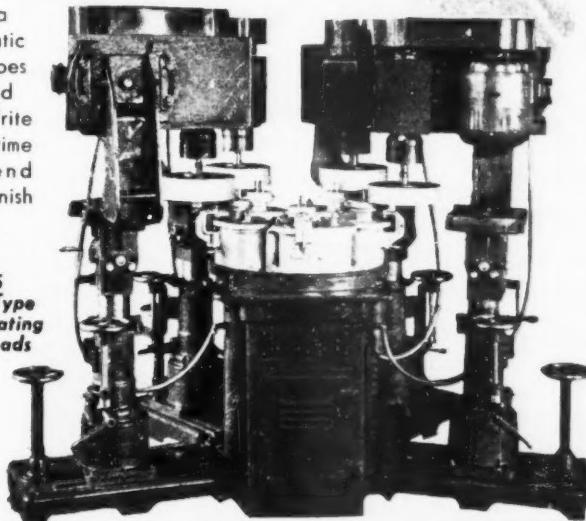
RECTIFIER DIVISION OF
RICHARDSON-ALLEN CORP.
15 WEST 20th STREET, NEW YORK 11, N. Y.

METAL FINISHING, December, 1945



There's a Packer-Matic for all shapes metals and finishes. Write for factory time study - send part and finish desired.

No. 4-5
Indexing Type
With Oscillating
Wheel Heads



That pirate of profits—High Costs—makes a dash for the nearest exit when a Packer-Matic takes over. For here is a machine that reduces the hand work of polishing and buffing to the decimal point. Production goes up, costs go down and that elusive thing called "Profit" returns to the ledger.

Packer-Matic

THE PACKER MACHINE CO., MERIDEN, CONN., U.S.A.

MAKE YOUR PLASTIC A CONDUCTOR OF ELECTRICITY

Metaplast
introduces
Silver Conductive
Paints

especially developed for plastics and other non-conductive materials to give a low-resistant conductive coating for electro-plating, electrostatic shielding and other electrical purposes.

Metaplast Silver Conductive Paints can be sprayed, dipped, brushed or printed . . . after sufficient drying time elapses the coating becomes hard and electrically conductive . . . applications are numerous . . . from the printing of electric circuits to electro-plating on non-conductive surfaces.

Metaplast Silver Conductive Paints are for sale by the troy ounce, to all interested firms.

NOTE: The use of Silver Conductive Paints for electroplating plastics is not to be confused with Metaplast's patented process.

Metaplast COMPANY
205 19 St., N.Y. 11, N.Y.
California 1027 N. Seward, Los Angeles 38
METAPLAST PROCESS PATENTED AND LICENSED
METAL PLATING ON PLASTICS
METAPLAST INTERNATIONAL: ENGLAND • FRANCE • CANADA • ARGENTINA • BRAZIL • AUSTRALIA



Joe the Job Plater Says:

*My foreman insists on
HARSHAW ANODES & CHEMICALS
for uninterrupted operation*



production records confirm his claims



The satisfaction Joe's plating foreman is experiencing with Harshaw Anodes and Chemicals is reflected in plant production records and is duplicated in other plants where Harshaw plating materials are in use.

Production records pass over Joe's desk. That is how he learns the true facts about whether or not his plating production has been uninterrupted.

These plant production records confirm his foreman's confidence in top performance by Harshaw plating materials and explain why all shop plating requisitions specify Harshaw.

Order Harshaw materials for silver, cadmium, zinc, chromium, lead, copper, nickel, and tin plating . . . for top plating performance.

SEND FOR

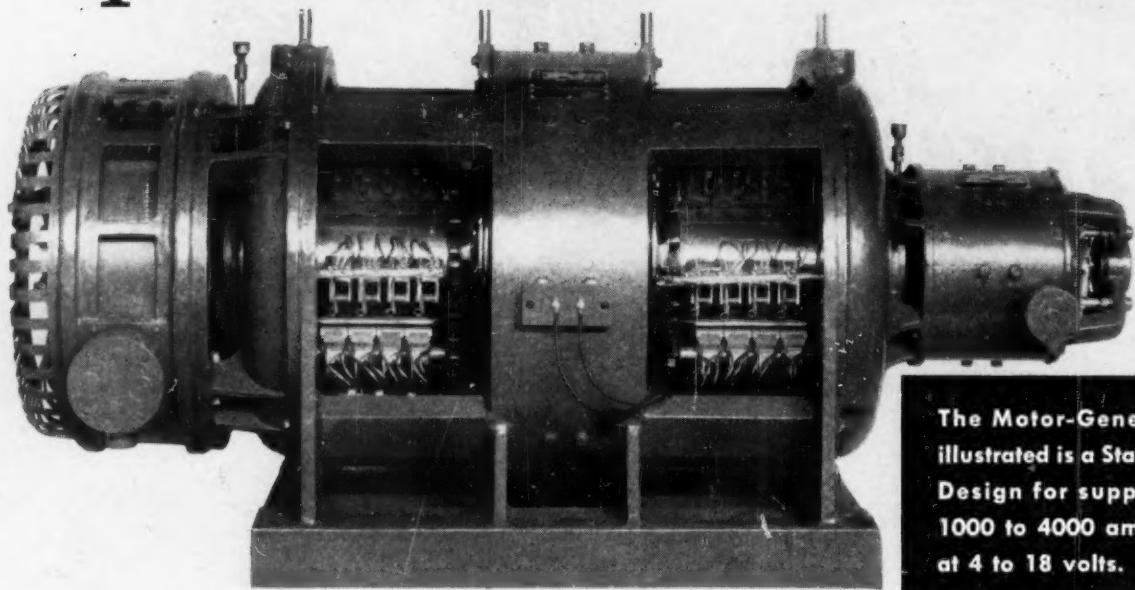
- Lead Plating Booklet of Practical Information
- 32-page book listing Industrial Chemicals
- 72-page price list of Laboratory Chemicals



THE HARSHAW CHEMICAL CO.

1945 East 97th Street, Cleveland 6, Ohio
BRANCHES IN PRINCIPAL CITIES

Φ MOTOR-GENERATORS



The Motor-Generator illustrated is a Standard Design for supplying 1000 to 4000 amperes at 4 to 18 volts.

Provide More for Less

SINCE 1904, E. P. Motor-Generators have been proving continuously that they provide MORE plating value for LESS overall cost . . . that they:

1 ASSURE A LOWER LIFE-TIME COST

The minimum life expectancy of E.P. Motor-Generators is at least 15 years with no replacement of major parts.

2 CONSUME LESS ELECTRICITY

E.P. Motor-Generators have a minimum guaranteed lifetime efficiency of 75%. Savings from this high efficiency will frequently amortize the complete investment in only a few years.

3 PROVIDE MORE AMPERES PER DOLLAR

Motor-Generators, because of their inherent reserve capacity, can handle safely the frequent heavy overloads required in plating service.

4 RAISE LOW POWER FACTOR

E.P. Generators, 750 amperes and above, are

For full details regarding these Seven Points, ask our Representative, or write for Bulletin 204, a copy of a talk given before the Cleveland Electroplater's Society entitled "More for Less."

driven by synchronous motors which supply power factor correction at no extra cost.

5 MINIMIZE PLATING COSTS

Since the amount of amperes that flow through a plating solution varies with the voltage, the constant voltage of E.P. Plating Generators assures the same rate of deposit at all times, and thereby the lowest plating cost.

6 REQUIRE NO SPECIAL PROTECTIVE EQUIPMENT

Experience has proved that E.P. Motor-Generators can operate safely under the extreme conditions common to most electroplating operations. High room temperatures do not affect them. They do not require expensive forced-draft ventilating systems.

7 NEED PRACTICALLY NO MAINTENANCE

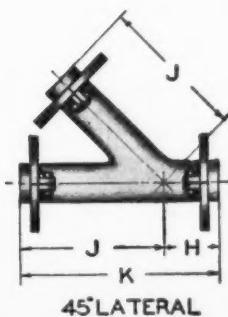
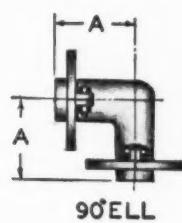
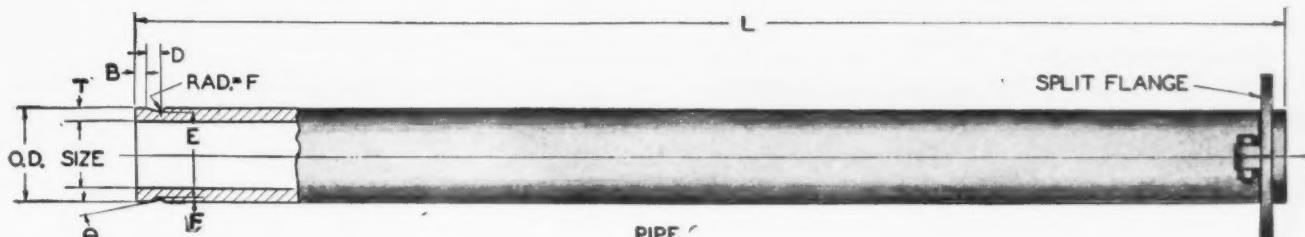
Operator after operator has gone on record that year after year, the only maintenance required for E.P. Generators is a periodical oiling and an occasional replacement of brushes.

The Electric Products Co.

1737 CLARKSTONE ROAD • CLEVELAND 12, OHIO

X-8

HAVEG piping...valves...fittings will help you solve your chemical piping problems... because HAVEG defies corrosion



MADE IN LONG LENGTHS

HAVEG Chemical Pipe lines are quickly installed with a minimum number of joints. In standard sizes 1" to and including 12" HAVEG piping is furnished in ten foot lengths. Joints are easily handled since connections are of a simple split flange design which is quickly assembled and assures a positive leak proof joint.

A TOUGH non-brittle PLASTIC

HAVEG chemical piping is made of asbestos fibres bonded together with a synthetic resin under heat and pressure. HAVEG piping is strong, tough and resilient. It requires no special handling as it is not brittle. It is chemical resistant THROUGHOUT ITS ENTIRE MASS, therefore surface scratches or even deep gouges do not impair its chemical resistance. Should cracks or breaks occur, they are readily mended, on the job, with HAVEG repairing cement. HAVEG piping is unaffected by rapid temperature changes and can be used continuously at temperatures as high as 265° F (130° C).

READILY CUT AND FITTED "on the job"

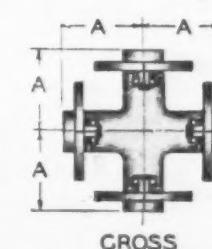
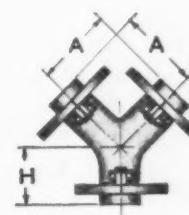
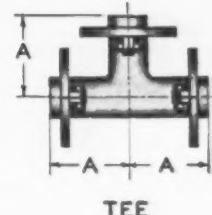
HAVEG piping is supplied in standard 10 foot lengths complete with connections, expansion joints, fittings and valves where chemical pipe lines can be blueprinted before installation. Where lines cannot be planned in advance, or where for some other reason it is desirable to erect lines as installation of tanks, towers and other equipment proceeds, HAVEG piping is readily cut and fitted "on the job". HAVEG is readily cut by using a band, circular or hack saw. It is conveniently machined about the same as brass, using high speed and slow feed. It may be machined dry, not requiring lubricants or water.

HAVEG bulletin F-(68) gives complete data on how to specify, erect and service HAVEG piping.

Send FOR TECHNICAL BULLETIN

HAVEG chemical piping is made in standard sizes 1/2" to and including 12". The illustrations shown here are from the piping section of Bulletin F-(68) which gives complete engineering data on HAVEG pipe, valves, fittings, pumps and other accessories. You can design complete installations from this data. Send today for Bulletin F-(68).

HN-1-45



HAVEG CORPORATION NEWARK 68, DELAWARE
FACTORY - MARSHALLTON, DELAWARE



CLEVELAND 14 550 Leader Building



CHICAGO 11



DETROIT 11 1201 Palmolive Building



DETROIT 11 2832 E. Grand Blvd.

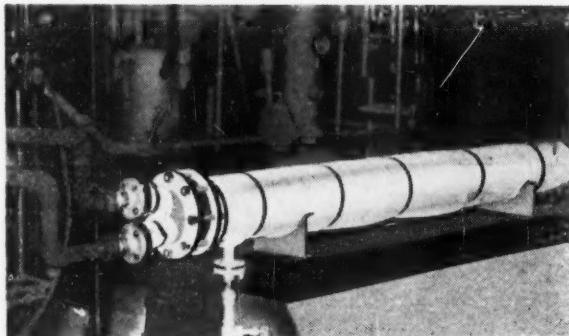


LOS ANGELES 13 601 W. Fifth St.

HEAT EXCHANGERS

for: Bright Nickel and Other Chemical Solutions

CARBON TUBE HEATING COILS

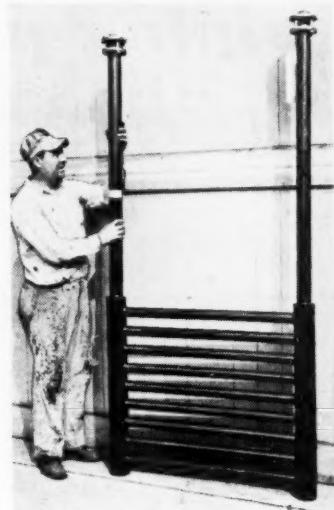


NO. 1274 HEIL NOCORODAL EXCHANGER

for
CHLORIDE BATHS
MURIATIC PICKLE
HYDROFLUORIC DIP

• • •

VERY RESISTANT
NON-METALLIC
FAST HEATING



LADDER COIL

Excellent Heat Transfer

No Contamination

Corrosion Proof

HEIL ENGINEERING COMPANY

12901 ELMWOOD AVE.

CLEVELAND 11, OHIO

Dip or Spray! and Bake!

NO PRIMER
REQUIRED

SPEKALUMINITE

Trade Mark Reg.

LOWER in COST! • GREATER in BEAUTY!

Adheres perfectly to all metals, glass, gutta percha, etc. Try it and see for yourself how SPEKALUMINITE can cut your costs and give you a far superior decorative and rust resistant finish that is Flexible, Durable and can be bent or formed without cracking or peeling. Requires no expensive equipment—just a baking oven. Investigate further its money saving advantages.

Send today for a trial supply of SPEKALUMINITE (Special quart container \$2.00)—test its superior features under your own plant conditions or send samples to be SPEKALUMINITE finished by us.

Price Schedule on request.

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SPEKALUMINITE CORP.
30 IRVING PLACE NEW YORK 3, N. Y.

QUALITY  PRODUCTS

Features

- ✓ COSTS LESS than Electroplating
- ✓ DECORATIVE White Finish. Beautiful Soft Color
- ✓ 80% REFLECTIVITY of Silver
- ✓ FLEXIBLE Hard Finish
- ✓ WILL NOT PEEL or FLAKE
- ✓ TARNISH and RUST RESISTANT

- •
- ONE COAT DIP WITHSTANDS SALT SPRAY

on Cast Iron—196 hours
on Rolled Sheet Steel—72 hours

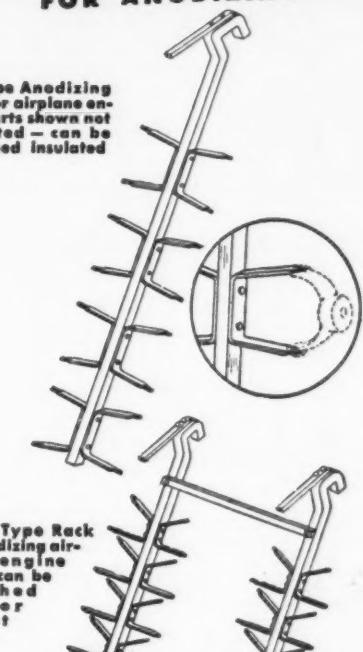
Insist On Genuine

BELKE PLATING RACKS

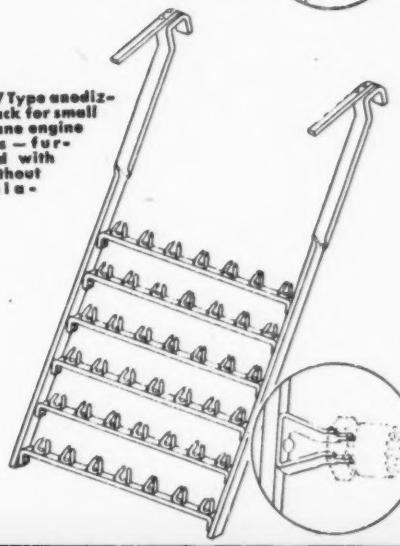
New—Wonderful Synthetic Insulation

FOR ANODIZING

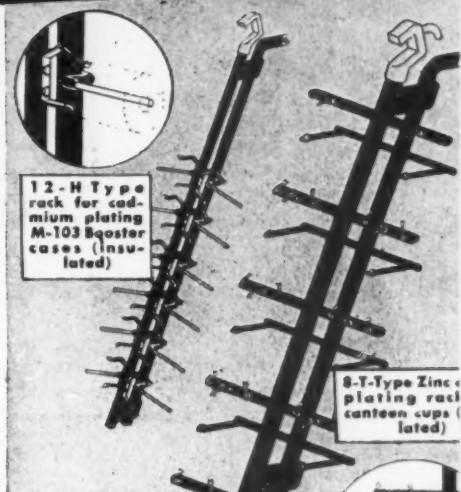
8-H Type Anodizing Rack for airplane engine parts shown not insulated — can be furnished insulated



36-LV. Type Rack for anodizing airplane engine parts—can be furnished with or without insulation

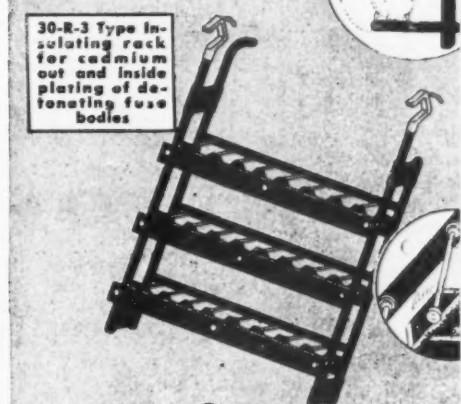


42-R-7 Type anodizing rack for small airplane engine parts — furnished with or without insulation

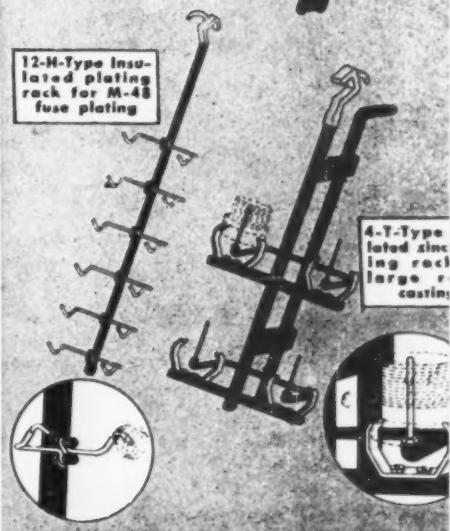


12-H Type rack for cadmium plating M-103 booster cases (insulated)

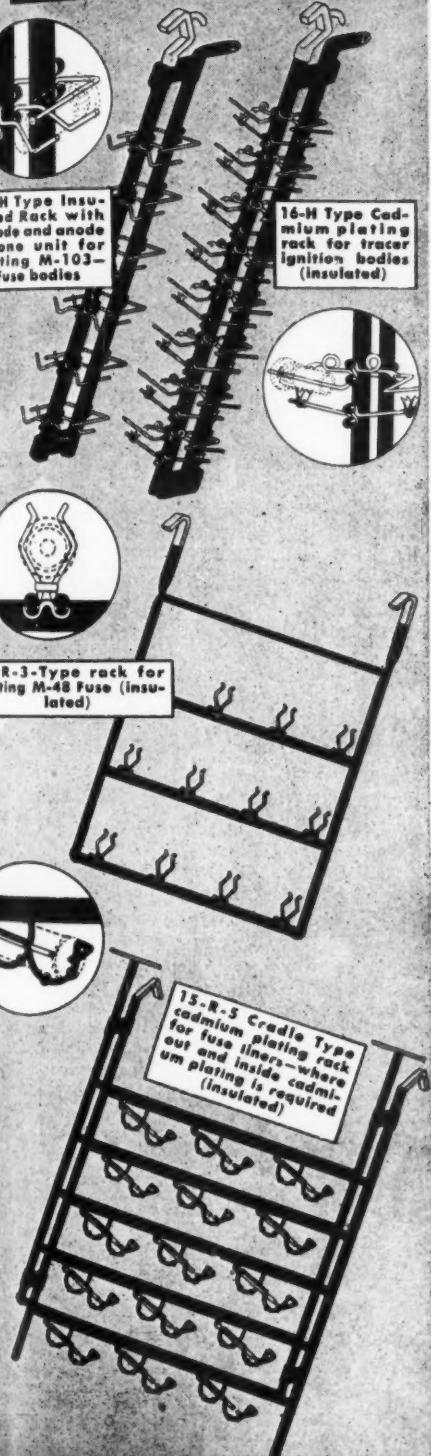
30-R-3 Type Insulating rack for cadmium out and inside plating of detonating fuse bodies



12-H-Type Insulated plating rack for M-48 fuse plating



4-T-Type Insulated plating rack large casting



BELKE

MANUFACTURING COMPANY
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DUPONT "CADALYTE"

for CADMIUM PLATING

is so SIMPLE — SO

EASY to OPERATE!

★ There's no simpler way to get quality cadmium plate at low cost than with "Cadalyte"—the *complete* plating salt!

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MANUALLY OPERATED

PLATING BARREL APPARATUS
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U. S. GALVANIZING & PLATING
EQUIPMENT CORPORATION

Incorporated 1896

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PROTECTING more cans of food with less tin



MORE FOOD NEEDED at home and abroad . . . more tin cans needed to protect food on the way. Could they be produced — even though tin sources were largely in Jap hands? America's tin plate industry said "We can do it" — and did!

By electrolytic plating, tin was deposited more thinly on the steel-base can stock than older methods permitted. Tin supplies were s-t-r-e-t-c-h-e-d, food still adequately protected.

Hanson-Van Winkle-Munning co-operated closely with the tin plate industry in the development, manufacture and installation of continuous, high-speed electrotinning units.

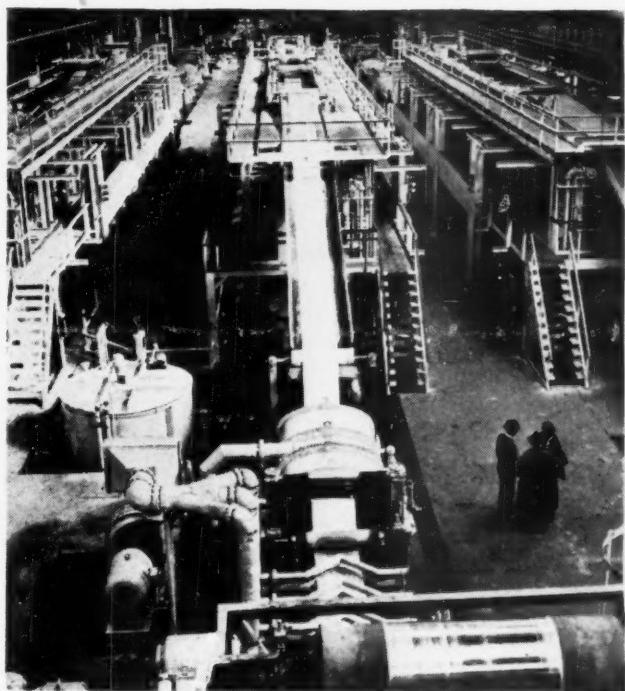
H-VW-M, in fact, has worked closely with all metal-working industries for 125 years—and is ready at any time to extend technical assistance to you.

If any of the authoritative H-VW-M bulletins bear on your present problems, you may have them without obligation by writing for them by the numbers listed below.

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Manufacturers of a complete line of electroplating and polishing equipment and supplies
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Sales Offices: Anderson · Chicago · Cleveland · Detroit · Elkhart
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Three H-VW-M strip plating lines showing three-decked plating units.

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Baskets (Dipping)	No. D-105
Brushes	No. BR-103
Buffs and Compositions	No. BC-104
Centrifugal Dryers	No. CD-101
Cleaners	No. C-105
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Electroplater's Microscope	No. EM-101
Generators	No. G-101
Rectifiers	No. ER-103
Rheostats (Tank)	No. TR-A-526
Tanks	No. T-104
Wheels (Polishing) Glue and Abrasives	No. W-101
Wrap Rax	No. WR-102

H·V·W·M

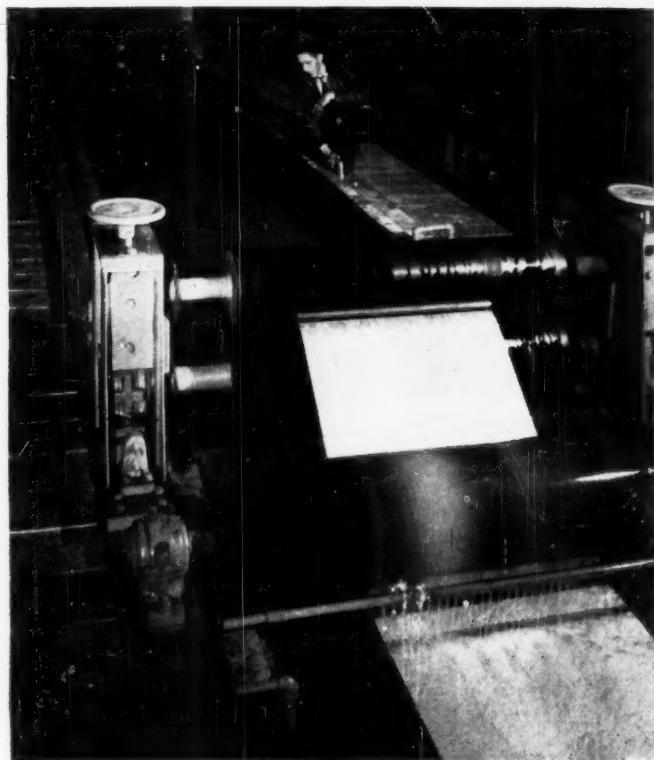
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Equipment for

• LIGHT DEPOSITS

• HIGH SPEEDS

• FULL CONTROL



*Strip passes through solution-recovery tank,
minimizing losses of valuable dissolved tin.*

IN SOME OF America's best known steel plants, H-VW-M synchronized and continuous electrotinning systems are handling 36 to 22-gage steel strip 14 to 38 in. wide, and turning out an average of 500 feet of electrotinned steel per minute.

Speeds up to 1300 feet per minute are possible, with full control of current densities, solution levels, deposit thickness, de-hydrolyzing, and mechanical control of drag out. Installations form continuous lines with complete cycles for electrocleaning, pickling, brightening, and finished product processing.

H-VW-M systems lend themselves also to controlled high-speed strip-coating with metals other than tin or zinc, and with different metals on each side.

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Manufacturers of a complete line of electroplating and polishing equipment and supplies

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As an aid in the control of plating baths of
NICKEL, ACID ZINC, TIN, CYANIDE
ACID COPPER, CADMIUM, BRASS and BRONZE



LaMotte Block Comparators

for pH tests to accurately control the acidity and alkalinity of nickel, zinc, tin or cyanide baths. Inexpensive and easy to operate. A test can be made in a few minutes.

LaMotte Acid-Copper Analytical Set

for accurately determining and regulating the acid and copper content of the bath to insure uniform results.

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**FOR PERFECT COLOR
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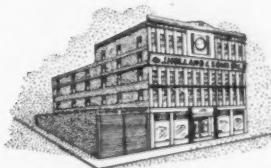
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Electroplating and Finishing Equipment
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MOTOR GENERATOR SETS All Sizes and Types

Rheostats 50-1500 amperes with or without meters.

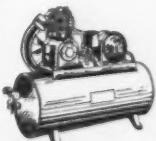
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Sizes 3-15 horsepower. Complete unit is ball-bearing, totally enclosed, Sturdy construction.



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Spray guns, Air compressors, Spray booths and complete paint finishing units. Baking ovens.

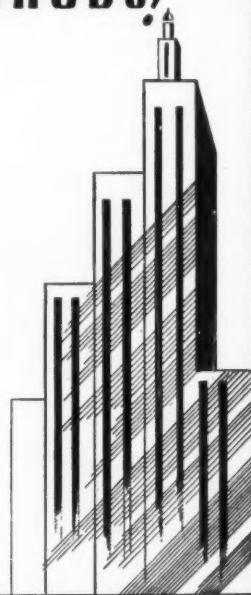


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MODERN INDUSTRIAL CLEANING METHODS!

Removal of heavy oils, grease and drawing compounds from steel parts often presents a difficult problem, which no ordinary cleaning material will solve. AHCOLOID 70 produces the clean surface necessary for paint, phosphate coatings, electroplating or further fabrication.

And it does its work quickly, efficiently and economically.



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GOLD PLATING SOLUTIONS IN ALL COLORS

Guaranteed 100% Pure Gold Content

We have developed new appealing colors in gold and will be glad to plate samples at no charge.

**STAPLE GOLDS—COLOR CONSTANT
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Write or call our experts about your plating problems.

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PUT RUST TO WORK!

Brush or spray Nobs Glazecoat directly on rust. Rust aids in forming a permanent thermo-plastic coating that is not affected by water, alcohols, dilute acids, or alkalies. Prevents further rusting. Stands heat to 400° F. Covers about 300 sq. feet per gallon.

PRICE . . . \$3.50 PER GAL. F.O.B. LOS ANGELES

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IMMEDIATE DELIVERY

3 HP Westinghouse, 230 volt DC, 2000 RPM. on cast iron pedestal, double shaft extension, 10". Complete with retaining rings.

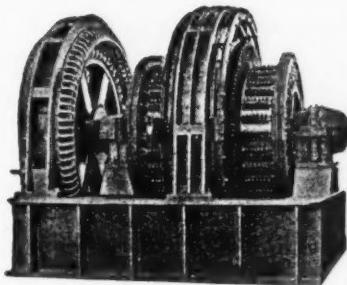
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PLATERS

- (2) 50 amp. 6 volt Leland with 1 ph 60 cy. MD.
- 60 amp. 16 volt Western Elec. 1750 RPM.
- 100 amp. 6 volt Columbia 1800 RPM.
- 100/125 amp. 7½ volt Hobart with 220/440 volt, 3/60 MD.
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- 400/200 amp. 7½/15 volt Hobart with 220/3/60 MD.
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Largest and most complete stock of plating generator sets in America, too numerous to list, 100 amperes, to 7500 amperes, 6/12 volts. Rheostats, Tumbling, Burnishing and Mechanical Plating Barrels.

Polishing & Buffing Lathes—Belt Drive, Motor Drive and Multi "V" Belt Drive.

Blowers, all sizes, belt and motor driven.

We carry a complete line of plating and polishing equipment and supplies.

Whatever your requirements may be in the plating and polishing line—call us for prices before placing your order.

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(AVAILABLE FOR IMMEDIATE SHIPMENT)

- 1-5000/2500 AMPERE, 6/12 VOLT, A. P. MUNNING COMPANY, "OPTIMUS" Design, Motor Generator Set. Separately Excited. Excellent Condition, Full Control Equipment.
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PLATING DYNAMOS AND GENERATOR SETS

All sizes carried in stock of tumbling and plating barrels, and other equipment for the metal finishing trade.

Used equipment bought for cash. If you have metal finishing equipment for disposal, send us full details, and we will contact you.

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- 1-2000 Ampere 6 Volt M.G. Set complete with control Panel.
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- 6—Abbott Ball Burnishing Barrels (various sizes).
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The most complete line of scratch brushes, buffs, felt wheels, emery wheels, buffing compounds, plating supplies, polishing supplies. All sizes and shapes.

PeKay-Synthetic rubber wheels for fine emerying and deburring. Plastic finishing equipment and supplies a specialty.

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MANUFACTURERS OF PESCO EQUIPMENT

Plating Barrels, Rheostats, Polishing machines, Utility Blower Systems, Burning machines on benches with Dust Removal System.

Complete suppliers of anything for the plating or polishing rooms for metal or plastics.

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WANTED — ELECTROPLATING: Generators, Rectifiers, Rheostats, Barrels, etc. We will buy or sell any electroplating or polishing: EQUIPMENT—CHEMICALS—COMPOUNDS. State full particulars.

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WANTED—From 1 to 100 Gardner Polishing Machines, No. 1, 2, 3. Any condition. Plating generators from 50 amp. at 6 volts up to 5000 amps. Any equipment and supplies for the polishing and plating shop. Send list and prices.

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WANTED—Baird Double No. 2 Ball Burnishing machines. Please state full particulars.

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SITUATION OPEN — Familiar with automatic polishing and buffing of steel and die cast parts similar in size to automobile bumpers and radiator grilles. Definite past experience in various phases of copper, nickel, and chrome polishing and buffing is essential. Position is with automotive company in Michigan having large installation of automatic plating and polishing equipment. Write: Box 1,000, care Metal Finishing, 11 West 42nd Street, New York 18, N. Y.

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SITUATION OPEN—Man thoroughly experienced in metal finishing, forming and shaping who would like to work with Technical Service Department of nationally known manufacturer. As the work would require practical application of knowledge to cleaning, maintenance and processing operations, production experience is necessary. Location, N. Y. with some traveling. Reply to: Box 567, Church Street Annex, New York, N. Y.

SITUATION OPEN—In Cleveland, assistant Electro Plater on various finishes applied to small parts. Permanent position. State age, former employers, salary expected. Address: Box No. 150, care Metal Finishing, 11 West 42nd Street, New York 18, N. Y.

SITUATION OPEN—Thoroughly experienced Foreman for metal polishing, grinding, and white metal. Good pay—permanent. State full particulars. Address: J. D., care Metal Finishing, 11 West 42nd Street, New York 18, N. Y.

SITUATIONS WANTED

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SITUATION WANTED—Here is a man who will be an asset in your organization. He has a chemical engineering degree and rounded it off with a few years of mechanical and industrial engineering experience, including supervisory work. Desires to bring his training and ambition into metal finishing field. I can invest small capital. Why don't you invest in a letter? 29 years. Small business only. New York area. Address: November 99, care Metal Finishing, 11 West 42nd Street, New York 18, N. Y.

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SITUATION WANTED—Graduate Chemical Engineer with fifteen years experience in electroplating and related processes would like a position in large job shop. Draft status 2B. Will locate anywhere. Address August 4, care Metal Finishing, 11 West 42nd St., New York 18, N. Y.

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SITUATION OPEN—Experienced and industrial following. Large facilities for BLACK OXIDE FINISHING on steel; also grinding, polishing, buffing, etc. on steel, stainless, brass, aluminum, nickel, Monel, etc. Good opportunity for a live wire. Commission basis.

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SITUATION WANTED—Representative available to manufacturers of metal finishing equipment and chemicals—Man with 20 years of practical experience in all branches of metal finishing and fabrication together with a good chemical background proposes to resign present position to act as sales-service engineer for an aggressive concern carrying a complete line of products relative to the metal finishing industry. To service the New England territory with headquarters in Western Massachusetts. For complete details, write November 14, care Metal Finishing, 11 West 42nd Street, New York 18, N. Y.

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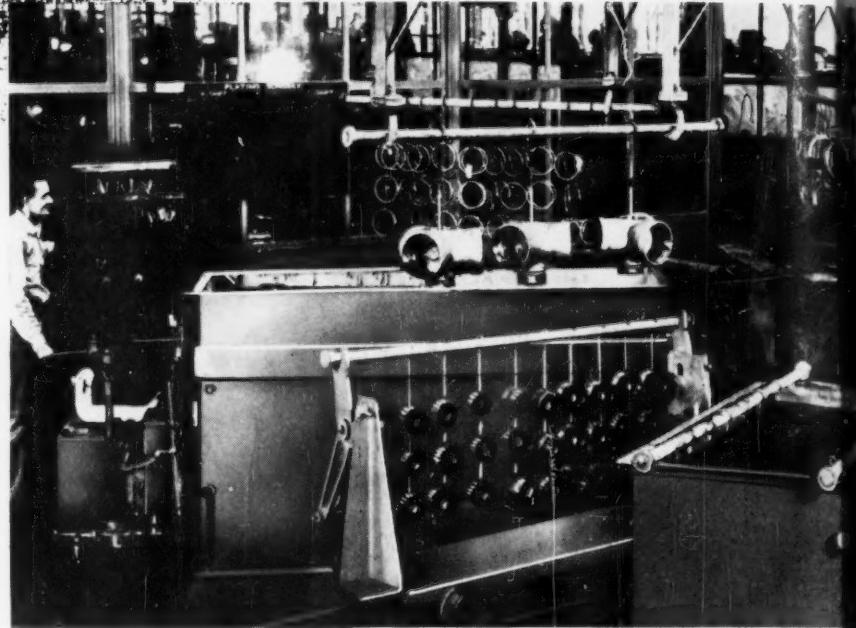
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